Full Throttle™

The Microsoft® Flight Simulator™ Pilot's Journal

April/May 1995 Vol.2 No.3
$8.95

How to get quick FS5 help by fax

Fuel systems in FS5

We review the latest Flight Simulator version—5.1

Full Throttle survey results

Fly "Cross Country" through busy L.A. airspace

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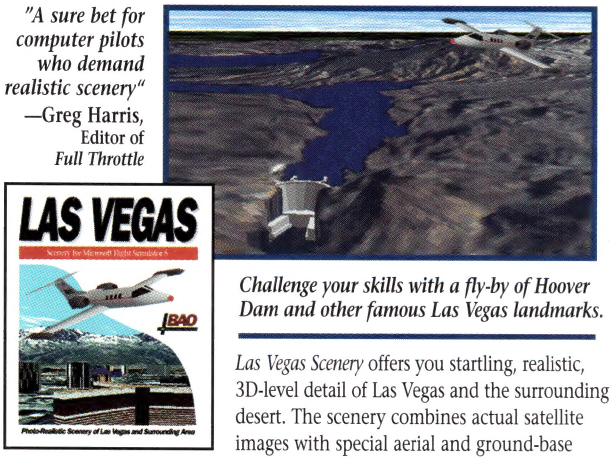
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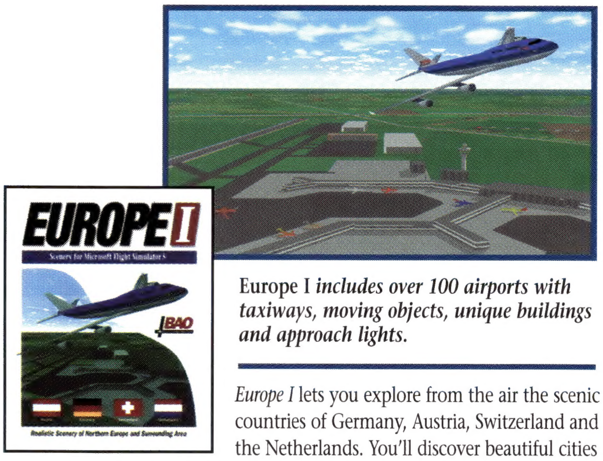
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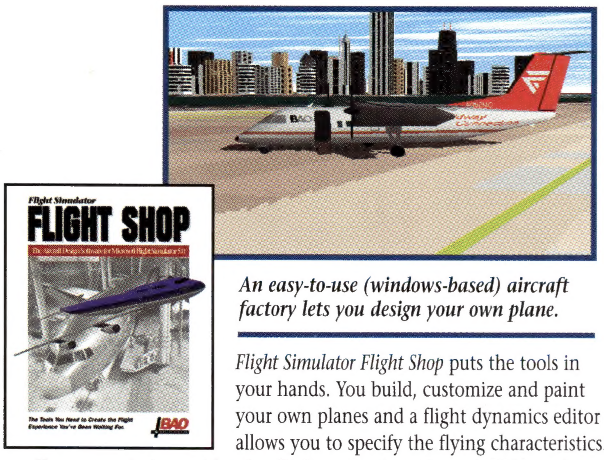
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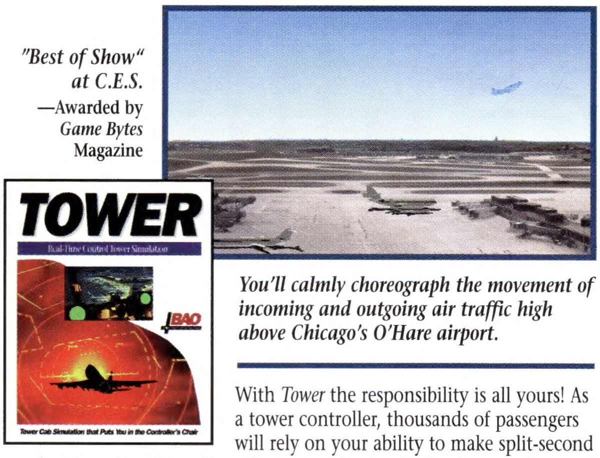
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All information in *Full Throttle* is intended for use with Microsoft Flight Simulator (version 5.0 and higher) only. This information is not intended for use in actual flight situations. While the maps, logs and other information are as realistic as possible, you should not use them for actual flying instruction. Safe flying!

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April/May 1995

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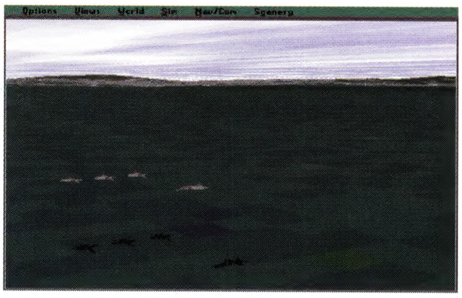

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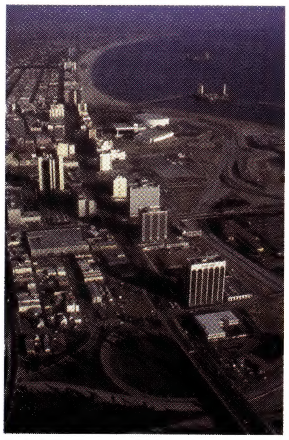

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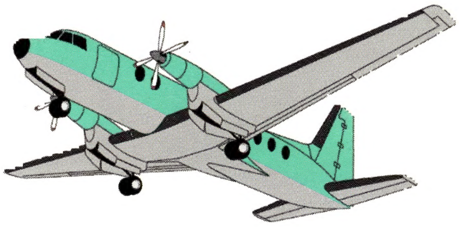


Cover: Los Angeles has some of the busiest airspace in the United States, and this month's "Cross Country" flight takes you through it! (Photo courtesy of Los Angeles Convention and Visitors Bureau.)

A RAM jet for FS5

I just received the December 1994/January 1995 issue of *Full Throttle* and finally felt compelled to write a letter to you. I enjoy your publication and use the "Cross Country" flight plans from each issue. I have read in previous issues about the use of multi-configurations for DOS 6 and the use of expanded memory with Flight Simulator. I think there's one interesting point about this subject that has not been explained fully.

When you are using the EMM386.EXE memory manager, if you add the RAM parameter to its statement in the CONFIG.SYS file, then the pool of extended memory is used as either extended memory or expanded memory as required by any programs that are running. Of course, a page file is set aside in upper memory, which will lower the amount of high memory that can be used for things like TSRs, but even after loading numerous TSRs, I haven't had any problems with using the RAM setting. (I am running a 50 MHz 486DX2 PC with 8 MB of RAM.)

The only additional parameter required for EMM386.EXE is D=64, which I needed to add after an error message was displayed while running Flight Simulator.

Steven E. Wills
Merrimack, New Hampshire

Thanks for the tip, Steven. Computer pilots who think they're having memory conflicts with FS5 can try adding the line

```
EMM386.EXE RAM 2048 D=64
```

to their computer's CONFIG.SYS file.

What's wrong with the Catalina runway?

I'm a charter subscriber to *Full Throttle* and am thoroughly enjoying it. I am using Flight Simulator 5.0a on a 486/66 machine and have run into two problem areas.

First, I like to fly from the Los Angeles area airports out to Catalina Island, and I appear to be running into a problem similar to that which was described a couple of issues ago ("Half Moon Bay Has Only Half a Runway," in the October/November 1994 issue). Just as I touch down at either end of the Avalon runway, I appear to fall below the runway and I crash. I then get the message "Building Crash." This anomaly has happened a number of times. The only way I have been able to get around it is to land well down the runway. But then I can't stop before running off the end.

Second, the Flight Simulator *Pilot's Handbook* shows the full Cessna instrument panel. The only thing I have been able to do is show the default abbreviated panel and tab back and forth for the right-hand instruments.

I would surely appreciate any explanation you could give me for these two anomalies.

Frank G. Vasser, Jr.
Texarkana, Texas

Those are good questions, Frank. To answer your first one, the problem at the Catalina runway seems to be one of the most elusive in FS5. For some people, the runway has an enormous but invisible pothole that their planes fall into on takeoff or landing. Others can use the runway

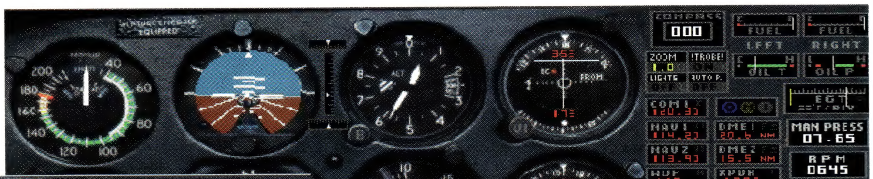


FIGURE A
If you have FS5 configured for VGA resolution, you won't see the full Cessna instrument panel.

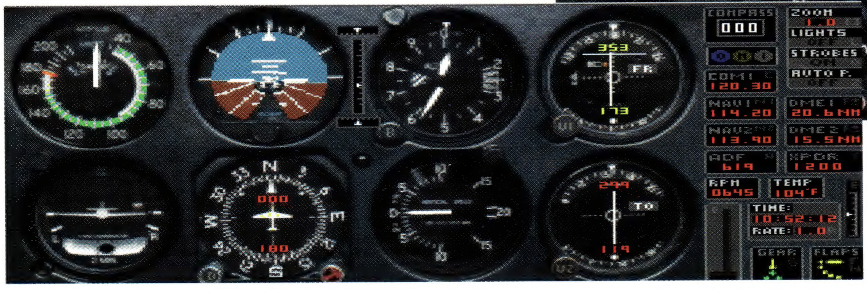
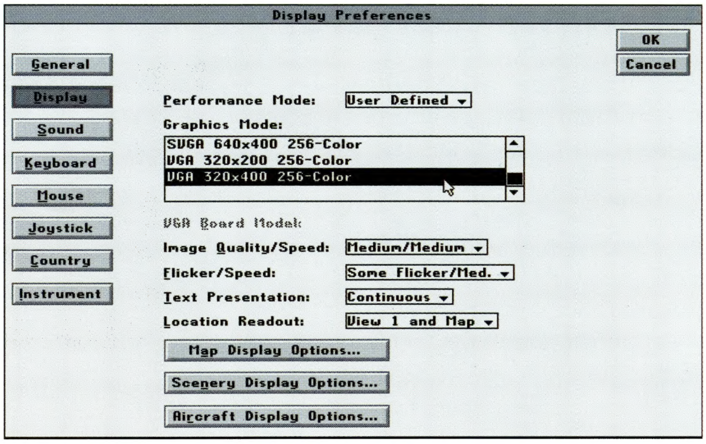


FIGURE B
At SVGA resolution, the full panel is visible.

with no difficulty. We touch on the problem in Alfred Poor's "Cross Country" article "Wedding Cake Blues," which begins on page 16. Happily, this bug is fixed in version 5.1.

If you're having this difficulty, try taxiing around the runway slowly to discover which sections are usable. You might discover that you can land on a portion of the runway without encountering the killer invisible pothole. You can also disable the Crash Detection feature as we described in the article "A Crash Course," in the February/March issue.



Performance Mode: User Defined

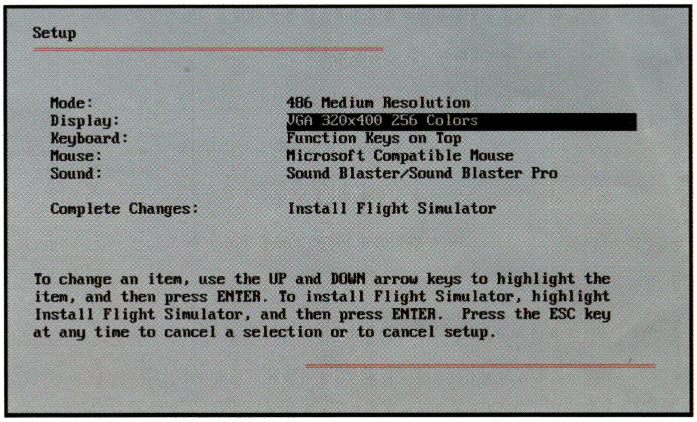
Graphics Mode:
SVGA 640x400 256-Color
VGA 320x200 256-Color
VGA 320x400 256-Color

VGA Board Model:
Image Quality/Speed: Medium/Medium
Flicker/Speed: Some Flicker/Med.
Text Presentation: Continuous
Location Readout: View 1 and Map

FIGURE C
You can use the Display Preferences dialog box to toggle between screen resolutions.

As to your panel display question, the key can be found in the Preferences… command under the Options menu. You use the resulting dialog box to switch your display between low- or medium-resolution VGA (Video Graphics Array) mode and high-resolution SVGA (Super Video Graphics Array) mode. As you can see in **FIGURE A**, when FS5 uses the VGA mode, you can see the standard instrument cluster (the six flight indicators), the two navigation radio Omni-Bearing Indicators (OBIs) and the radio stack, but you need to press the [Tab] key to look at the fuel and engine gauges.

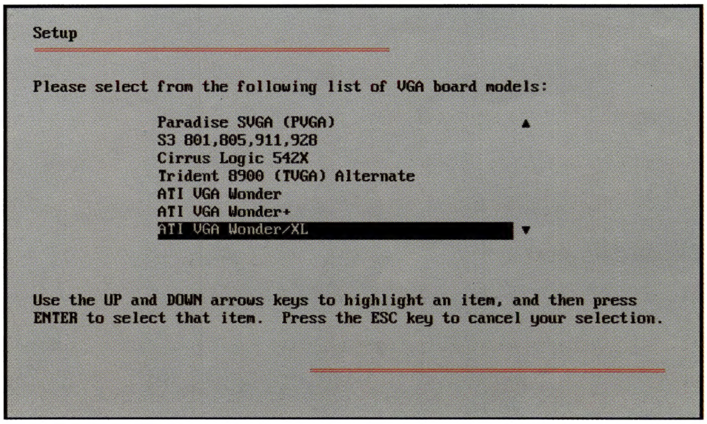
Under SVGA resolution, however, the entire Cessna instrument panel is visible, as shown in **FIGURE B**. (You still need to press the [Tab] key to access the engine instrument panel for the Learjet.) If FS5 is already configured to use SVGA resolution, you can choose the Preferences... command from the Options menu and then click on the Display button to access the Display Preferences dialog box, shown in **FIGURE C**. You can then click on the SVGA display option to change the video driver FS5 uses. When you click OK, FS5 will present a dialog box telling you to restart Flight Simulator in order to implement your changes.



```
Setup

  Mode:                       486 Medium Resolution
  Display:                    VGA 320x400 256 Colors
  Keyboard:                   Function Keys on Top
  Mouse:                      Microsoft Compatible Mouse
  Sound:                      Sound Blaster/Sound Blaster Pro

  Complete Changes:           Install Flight Simulator


To change an item, use the UP and DOWN arrow keys to highlight the
item, and then press ENTER. To install Flight Simulator, highlight
Install Flight Simulator, and then press ENTER.  Press the ESC key
at any time to cancel a selection or to cancel setup.
```

FIGURE D
You can change FS5's display resolution by using the Setup program.

If you've never configured FS5 for SVGA resolution and you have a compatible SVGA card, you can use FS5's Setup utility to make the new resolution available. To do so, just change to the FS5 directory, type *setup* and press [Enter]. You'll see the Setup program screen shown in **FIGURE D**.



```
Setup

Please select from the following list of VGA board models:

              Paradise SVGA (PVGA)                   ▲
              S3 801,805,911,928
              Cirrus Logic 542X
              Trident 8900 (TVGA) Alternate
              ATI VGA Wonder
              ATI VGA Wonder+
              ATI VGA Wonder/XL                      ▼


Use the UP and DOWN arrows keys to highlight an item, and then press
ENTER to select that item.  Press the ESC key to cancel your selection.
```

FIGURE E
You need to choose your SVGA card from the list provided.

Select the Display option and then choose the SVGA resolution from the resulting list box. FS5 will present a screen of information about the choice you just made; when you press [Enter], you'll then have to choose your SVGA card from the list shown in **FIGURE E**. When you've finished, the install program will run Flight Simulator and present the same initial preferences options it did when you first installed FS5. Once you've selected the desired options, you'll notice that your screen resolution is now twice as sharp—and you can now see the full Cessna instrument panel.

A carrier landing war story

Full Throttle keeps getting better with each issue—keep it up! The non-flight-related computer articles are especially appreciated.

As an old Navy carrier person (back seat driver, radar operator, on Grumman S2F sub chasers) I always get excited when I see an article like "Touching Down on FS5's Carriers" in the December 1994/ January 1995 issue. But as a user of the Mallard San Francisco scenery add-on, I then grit my teeth at the disappointment of the fact that the carrier doesn't appear in the San Francisco add-on scenery.

U.S. NAVY PHOTO

I would like to point out, however, that although you stated that "the *Nimitz* and its F-18 squadron do not appear in the add-on scenery," if you activate FS5's dynamic scenery setting, the F-18s do in fact appear in the add-on, along with the latest weapon in the U.S. arsenal—a stealthy aircraft carrier!

The Tomcats sitting atop this cloaked carrier appear to be parked in midair, complete with shadows on the ocean below them [as shown in **FIGURE A**]. Air ops are even going on as usual. I wonder if anyone has told the Russians yet?

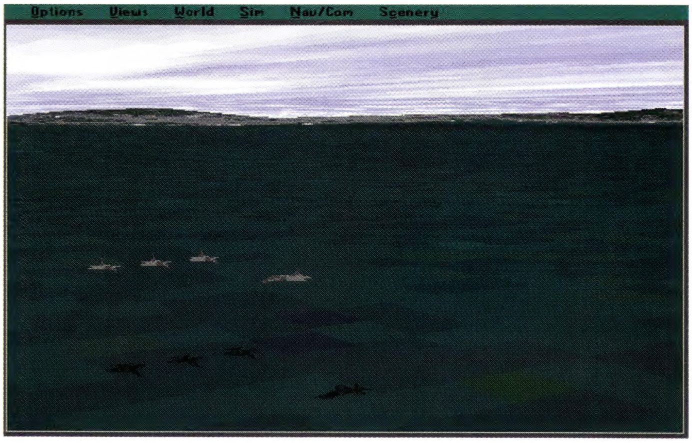
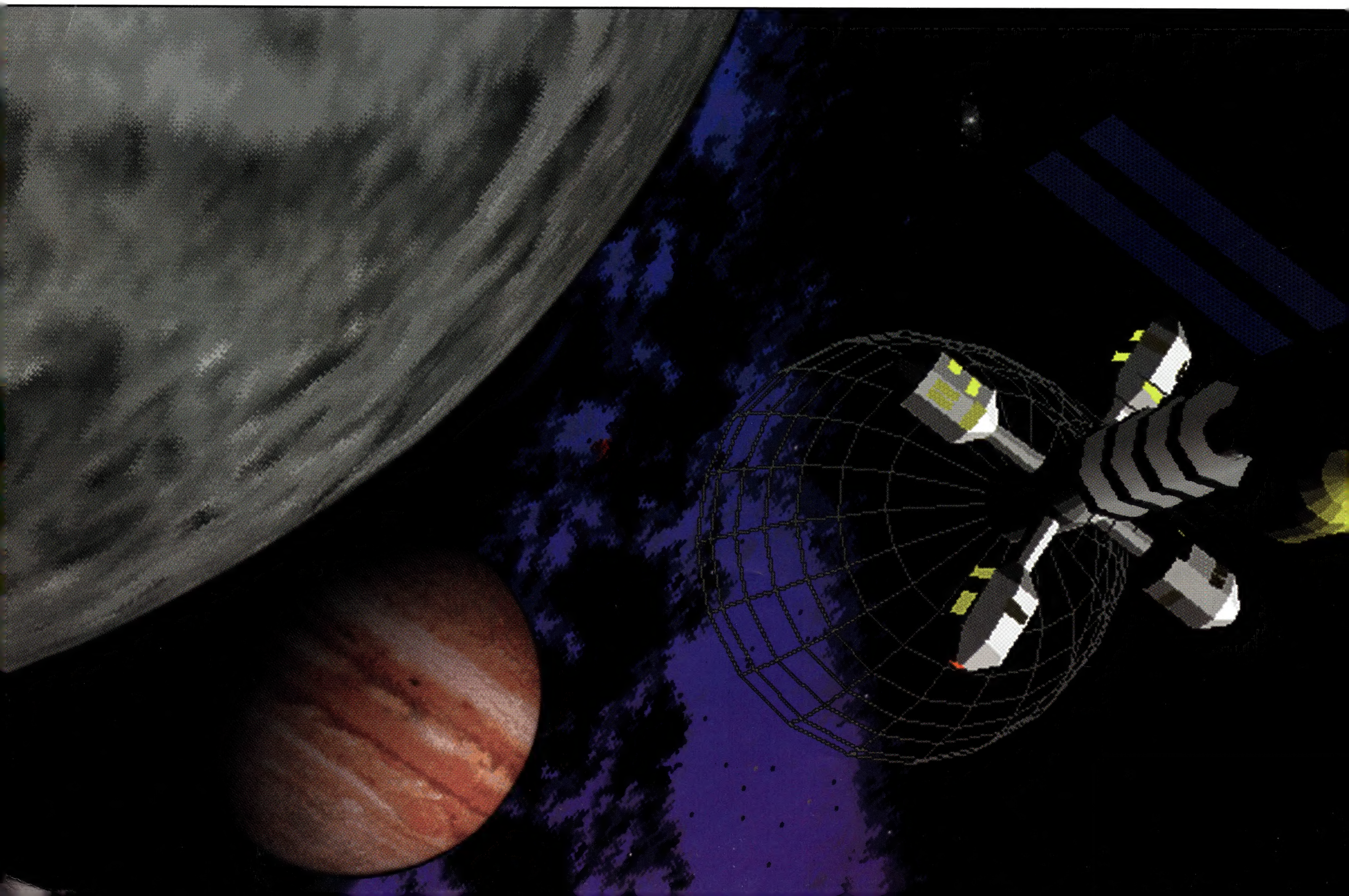


FIGURE A
If you activate dynamic scenery in Mallard's San Francisco scenery, an F-18 squadron appears on what seems to be an invisible aircraft carrier.



The Tomcats on the USS *Stealth* can be found by flying around as described in the article, and strangely seem to have better resolution than the ones in the original scenery. They also don't play hide and seek like the originals do when you're slewing around them in slow motion. Of course, when your flight deck is invisible, where do you hide?

By the way, where did Microsoft come up with the NAS North Island carrier situation name, anyway? I knew the Naval Air Station North Island, and the scenery in the situation is no NAS North Island, unless the Silver Strand linking Coronado to the mainland finally snapped, and the whole thing was sucked into San Francisco Bay.

Don Parker
Harrison, Arkansas

Thanks for sharing your discovery with us, Don. You're absolutely right about the dynamic scenery appearing in the San Francisco add-on. (Of course, the number of planes you see depends on the density level you've selected.) But dynamic scenery doesn't always appear in scenery add-ons—Microsoft has confirmed that none appears in its New York scenery upgrade, although it can be found in the default New York scenery area.

any questions?

If you have a Flight Simulator-related question, please share it with us! We can't guarantee an answer to every problem, but we're eager to give it a shot. If your question is of general interest, we'll print it in this column. You can mail your letters to

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Louisville, KY 40220

You can also send us a fax at (502) 491-3433. Or, if you prefer, you can send us E-mail at one of the following addresses:

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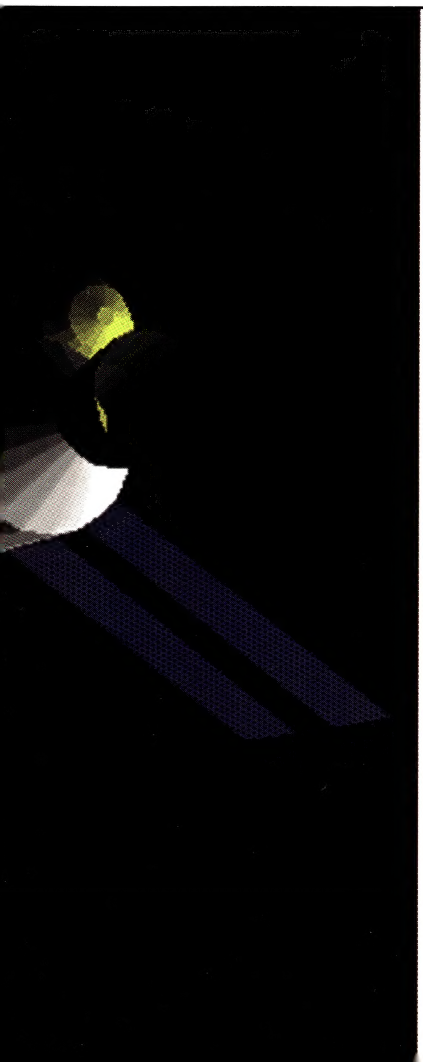
Please include your daytime telephone number. We reserve the right to edit letters for style and brevity.



If it were any more real, you'd be drinking Tang.

New Microsoft® Space Simulator is so authentic, even astronauts are asking for it. Select your spacecraft from our fleet and blast off. Once in space, command your ship in our free-flight mode. Explore the fiery red canyons of Mars, or the explosion of a supernova, all based on actual satellite data. It's just one of the realistic simulations we have waiting for you to take control. To get off the ground, shuttle over to your reseller and pick it up.

Microsoft Home

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Air show convention focuses on entertainment

In the air show industry, all the sky's a stage, and the players are the pilots who push their aircraft to the limit, darting, swooping and roaring from stage left to stage right.

What makes an event entertaining—an air "show" in every sense of the word—is how it's cast, how the action is paced, how the events are plotted and the production guided from the opening act to the dramatic finale. These factors were the subject of 41 educational programs to help the attendees of the 26th Annual Convention of the International Council of Air Shows (ICAS) become more entertainment-conscious and -competent. The show was held late last year in Reno, Nevada.

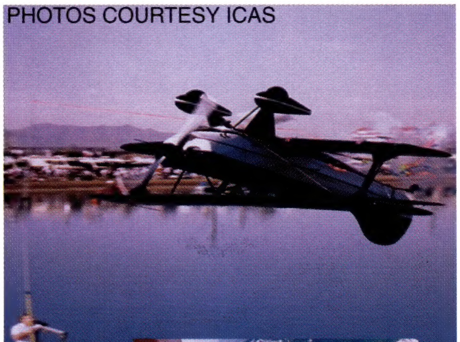
Exhibits for the convention, whose theme was "That's Entertainment!" covered 30 operational and professional areas. Theater professionals from Chicago helped pilots build a "performance persona" in sessions that focused on tapping each participant's inner creativity at the show.

Additional entertainment sessions focused on event choreography, ground activities and pyrotechnics. Other education programs reflected the International Council of Air Shows' continued commitment to air show safety, professionalism, showmanship and economic viability. The ICAS Safety Committee hosted a day-long, certificated air and ground operations training seminar in conjunction with the annual performer safety meeting.

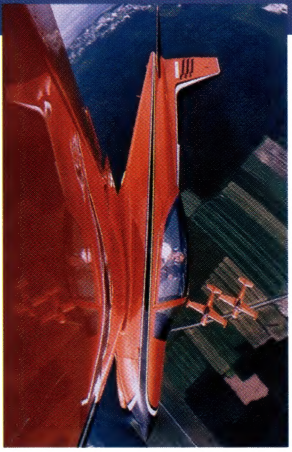
Serving the interests of more than 900 member organizations, ICAS is the air show industry's only full-service membership association.

ICAS fosters close partnerships with the military and regulatory agencies of both the United States and Canada, including the Federal Aviation Administration and Transport Canada. The leaders of both countries' military demonstration teams—the Blue Angels, Thunderbirds, Snowbirds, Skyhawks and Golden Knights—were among the military and regulatory representatives to attend.

Air shows provide a unique opportunity for enthusiasts to experience the wonder of flight by witnessing daredevil stunts, admiring vintage aircraft and more. For information on the upcoming air show nearest you, contact ICAS at (517) 784-2009.


PHOTOS COURTESY ICAS

GIL REBILAS


DANIEL MALLARD PHOTOGRAPHE

Flight Computing Catalog celebrates boom in simulation industry

Since Tailwinds acquired *Flight Computing Catalog* in 1992, the market for aviation software has increased substantially in both units sold and products offered. *Flight Computing Catalog* has reflected this growth by becoming one of the leading suppliers of aviation computing products.

Offering a greater selection of aviation simulation software has been one of the keys to success for *Flight Computing Catalog*, according to Jim Palozola, co-owner of the *Tailwinds* catalog and *Flight Computing Catalog*. Over the past two years, sales of flight simulation products have boomed. For example, sales of Microsoft Flight Simulator alone have climbed from a respectable 1 million in the first six months after its 1993 release to more than 2 million today.

"Although we don't take credit for the upsurge in the industry, it is great being in the right place at the right time," Palozola said.

Flight Computing Catalog carries FS5 and related software in addition to a line of computerized flight planners, logbooks, instrument trainers and so on.

Since 1986, the *Tailwinds* catalog has provided aviation computing products;

the acquisition of *Flight Computing Catalog* has positioned the company as a leader in the industry. Palozola said customers benefit from the excellent customer support that is the hallmark of the *Tailwinds* catalog, combined with technical support.

"Flight computing technical support is my Job One," said *Flight Computing Catalog* co-owner Nancy Palozola, a licensed pilot since 1972. "Being a pilot, I know how important accurate and timely help is to our customers. All of our vendors are required to provide support, and we add the unbiased viewpoint."

Nancy Palozola is also a seasoned air race veteran known for racing a Piper Twin Comanche in the first Round-the-World Air Race.

Flight Computing Catalog

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Full Throttle survey results

Response to the readers' survey we ran in the February/March issue of *Full Throttle* was great! We're examining the results to help tailor the magazine to your needs. And we're happy to report that the great majority of respondents indicated satisfaction with their subscriptions!

As we promised in February, we drew ten of the survey forms we received at random on March 1. The readers who sent in those surveys will each receive a bonus:

- A free one-year subscription to *Full Throttle* goes to Bryan Kong of Arcadia, California; R. E. Loftus of Cincinnati, Ohio; and David Fuller of Waxahachie, Texas.
- A free copy of Microsoft Space Simulator goes to Terry Robertson of Louisville, Kentucky.
- A *Full Throttle* coffee mug goes to Keith Kraft of Tulsa, Oklahoma; Richard P. Richter of Lakewood, New Jersey; and Neil Lambert of La Grande, Oregon.
- A free *Full Throttle* long-sleeve T-shirt goes to Shawn Kelly of Willard, Missouri; John P. Klecker of Troy, Michigan; and Brad Kinsman of Painted Post, New York.

Once again, we'd like to thank all the readers who sent in their responses. We're giving their voices due weight in determining the kind of articles we'll run in the future. If you'd like to register an opinion of your own, you can send us the survey in the February/March issue if you have a copy, or you can just write us a letter! Our U.S. and electronic mail addresses are on page 7.

Survey results

At press time, we were still compiling the results of the surveys we received. However, we do have a fairly accurate idea of many of the trends in reader responses. Here's a summary of the responses we received on a number of survey questions. Percentages are rounded to the nearest whole number.

How would you rate your familiarity with Flight Simulator 5, on a scale of 1 to 5?

Novice 1: 14% 2: 23% 3: 29% 4: 27% 5: 7% Expert

How would you rate your familiarity with computers in general, on a scale of 1 to 5?

Novice 1: 5% 2: 11% 3: 32% 4: 30% 5: 23% Expert

How would you describe your relationship to real-world piloting?

64%	All my flight hours are in Flight Simulator
10%	I'm a student pilot
13%	I'm a licensed pilot
5%	I'm a commercial or military pilot
8%	I'm a retired pilot

If you have so far restricted your flying to simulation, do you plan to pursue training for your pilot's license?

Yes: 57% No: 43%

What age group do you belong to?

Under 18	16%	18-30	8%
31-45	39%	46-60	24%
Over 60	13%		

Are you...

Male? 98% Female? 2%

What do you use to control Flight Simulator?

Joystick: 34% Yoke: 15%
Mouse: 18% Keyboard: 23%
Yoke/Joystick/Rudder combination: 9%

Please indicate how you'd like to see coverage of Microsoft Space Simulator in *Full Throttle.*

28%	I'm not interested in Space Simulator coverage
35%	I'd like to see an occasional article
28%	I'd like to see a regular column
10%	I'd like to see it in its own separate publication

All things considered, how satisfied are you with your subscription to *Full Throttle*?

Very satisfied 32% Satisfied 51%
Undecided 17% Dissatisfied 1%
Very dissatisfied 0%

Well-known FS5 author releases adventure package

Charles Gulick, author of six books on Microsoft Flight Simulator, has created a pair of disks full of FS5 situations that help computer pilots take full advantage of the Microsoft New York and Caribbean scenery add-ons.

Gulick's "Fly New York" and "Fly the Caribbean" disks contain a large number of pregenerated FS5 situations that provide everything from flight instruction to piloting challenges to an aerial tour of the Big Apple, the Caribbean and their respective environs. For example, you may have to inspect an aircraft and determine if it's airworthy, perform basic flight maneuvers over the Bahamas or explore up the Hudson River.

The situations come as a pair of .STN (FS5 situation) files; one uses the FS5 default instrument panel and the other uses a special "mini-panel," a panel arrangement providing a wider out-the-window view that's available simply by choosing a situation title containing an underscore (_).

The New York situation titles are each preceded by an n^; the Caribbean situations are preceded by a c^. This arrangement both keeps the situations grouped together and identifies a New York or Caribbean situation at a glance.

Each situation takes full advantage of the Description field, as you can see in **FIGURE A**. The ability to enter descriptive text along with a saved scenario was introduced to Flight Simulator in version 5. The screen in **FIGURE B** shows the beginning of one of Gulick's situations, which requires you to buzz a bridge and then set your Cessna safely down in St. Mary's Park.

the fly guy

Gulick's books on Flight Simulator include *Flight Simulator Odyssey*. Besides books, Gulick also writes the regular "Crosswinds" column on FS5 for *MicroWINGS* magazine. A resident of West Palm Beach, Florida, Gulick has been a Flight Simulator enthusiast since the original version appeared for the TRS-80 computer.

Gulick said the rapidly changing world of Flight Simulator is responsible in part both for the number of books he's written and his recent venture into disk publishing.

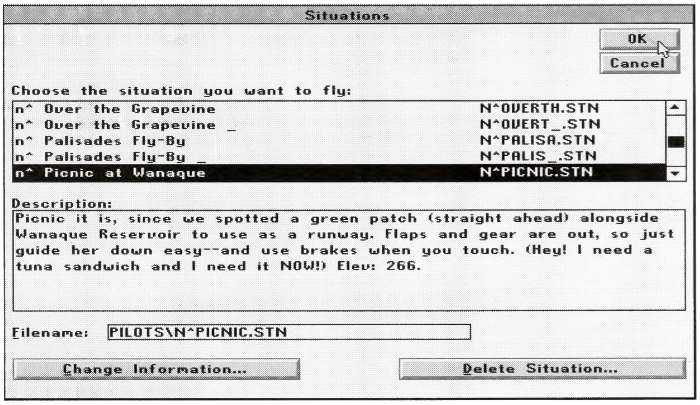
"The reason for the number of books is that Flight Simulator keeps changing," he said. "These fly disks are my present method of communicating. They don't go out of date so fast.

"I'm happy now to be able to do it this way. It's up-to-date when it goes out the door."

You can obtain the "Fly New York" and "Fly the Caribbean" disks by sending Gulick a check or money order for $20 for each disk or $36 for the pair. Postage and handling is included.

Fly New York
Fly the Caribbean
List price: $20 each
Both disks: $36

Charles Gulick
2810-C East Ashley Drive
West Palm Beach, FL 33415
Phone: (407) 642-7704



Choose the situation you want to fly:

```
n^ Over the Grapevine              N^OVERTH.STN
n^ Over the Grapevine _            N^OVERT_.STN
n^ Palisades Fly-By                N^PALISA.STN
n^ Palisades Fly-By _              N^PALIS_.STN
n^ Picnic at Wanaque               N^PICNIC.STN
```

Description:
Picnic it is, since we spotted a green patch (straight ahead) alongside Wanaque Reservoir to use as a runway. Flaps and gear are out, so just guide her down easy--and use brakes when you touch. (Hey! I need a tuna sandwich and I need it NOW!) Elev: 266.

Filename: PILOTS\N^PICNIC.STN

FIGURE A

Charles Gulick's "Fly New York" disk contains 67 ready-to-fly situations.

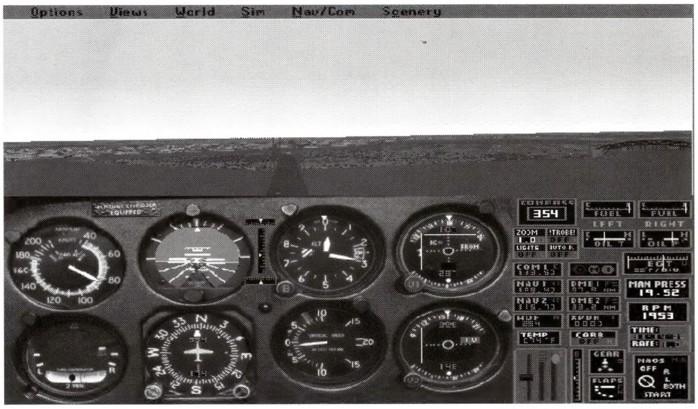


FIGURE B

The situations take you by some of New York's famous bridges and other scenery.

STUDENT PILOT *by David Harpe*

Engine failure

When the expensive end of the airplane gets quiet

You're at the end of a long cross-country flight. You're tired. Light turbulence along the way has given you a headache, and you just want to get home. But relief is in sight. A slight turn to final, another notch of flaps and you'll be on the ground at Meigs.

Then the engine coughs a few times, sending a chill up your back. You lift one of the muffs on your headset just to make sure you're not dreaming. All you hear is the sound of air sliding around the fuselage. A glance at the tachometer confirms what your ears are telling you: Your engine has quit.

Every student pilot has practiced the scenario described above. Flight instructors work hard to prepare the student for engine failures during every phase of flight. FAA examiners are required to verify that the pilot candidate knows how to handle engine failure emergencies before issuing a license.

In the near-perfect world of Flight Simulator, where your engine can keep turning even if it's out of fuel, you can easily forget that failures do happen. But they do—and if your engine quits while you're in the air, you'd better know what to do about it. In this article, we'll show you some of the most common engine-out scenarios and how to increase your chances of survival. Although we'll be dealing primarily with the single-engine piston-driven Cessna, feel free to try things out with the Learjet as well.

why do engines quit?

It might be hard to believe, but one of the most common causes for engine failure in general aviation aircraft is fuel starvation. Some pilots simply do not put enough fuel in the aircraft to complete a flight. Others will accidentally select an empty fuel tank before landing. Even if the correct tank is selected after the engine has failed, restarting the engine can be very difficult. The article "Fueling Around" on page 22 discusses how FS5 simulates the aircraft's fuel system.

On the Cessna, you'll notice the mixture control—it's the red handle to the right of the throttle, as you can see in **FIGURE A**. You use this control to adjust manually the amount of air mixed with fuel before it enters the cylinders.

As the aircraft climbs, the air becomes thinner. To keep engine performance high, you use the mixture control to rebalance the fuel-air mixture. When the mixture control is pulled out, the fuel-air mixture is "leaned," which means that less fuel is mixed with air. Since the air is thinner the higher you go, less fuel is needed for optimal performance.

You'll usually use the leaning operation after the aircraft has reached a cruising altitude, although you'll sometimes perform it before takeoff in high-altitude environments. But some pilots can fall into a trap after a long time at cruise altitude. As you approach a busy airport area, many things happen at the same time. Air traffic control is giving directions to descend and turn. If you're flying on instruments, you'll be preparing for the upcoming instrument landing. Radios need tuning. The cockpit becomes a very busy place.

As the aircraft descends, the air gets thicker. Therefore, the engine requires more fuel—another adjustment of the mixture control. A preoccupied pilot can overlook this adjustment. As the altimeter winds down, the engine slowly becomes starved of fuel. Fortunately, the engine will run rough before it quits, giving you a chance to correct the error. But if you're flying in turbulence, this roughness may go unnoticed.

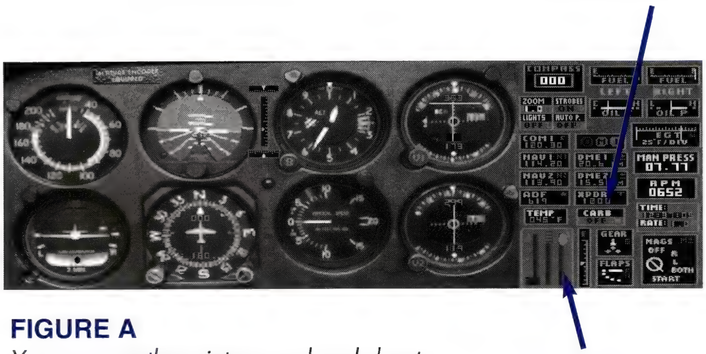


FIGURE A
You can see the mixture and carb heat controls on the Cessna's instrument panel.

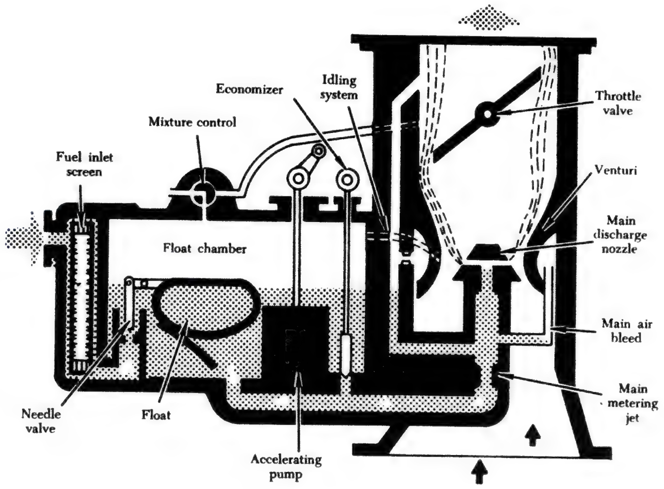


FIGURE B
This is a typical aircraft carburetor.

Another cause of engine failure is carburetor ice. For those who aren't familiar with engines, the carburetor is the device that mixes air with fuel before it's burned in the engine, as you can see in **FIGURE B** on the previous page. In certain temperature and humidity conditions, ice can form on the carburetor. When the ice formation gets large enough, it can block the air intake to the carburetor, as shown in **FIGURE C**. The engine chokes down because there's not enough air to burn the fuel.

A *carburetor heat* control (press [H] or click on the carb heat section of the instrument panel, as marked in Figure A, to activate it in FS5) allows exhaust-heated air back into the carburetor, melting any ice present. A slight loss of performance will result (as indicated by a drop in RPM on the tach) because of the hotter air entering the carburetor.

Carburetor ice can be particularly deadly when engine power is reduced for descent or landing. Ice formation can be so gradual at cruise speeds that the loss of performance will go unnoticed. When the engine is throttled back for descent or landing, however, the engine chokes down due to air starvation. Checklist procedures call for an application of carburetor heat during every descent and before every landing to avoid this problem.

Mechanical failures, although rare, also occur. Thrown piston rods, oil leaks and other problems can cause the engine to stop. You can detect some potential problems before takeoff by performing pre-takeoff engine checks. Other failures just happen unexpectedly, due to worn-out or defective parts. Although all aircraft engines are supposed to be maintained to high standards, sometimes mistakes or flaws occur.

the three most useless things

There's an old saying that the three most useless things to a pilot are the sky above the plane, the runway behind the plane and fuel left on the ground. We've already talked about fuel, so let's see how "the sky above" relates to engine failures and how you deal with them. We'll discuss "the runway behind the plane" a little later.

When an aircraft is in level flight, a balance of forces exists. The friction of the air against the surface of the plane, or *drag*, is countered by the *thrust* of the engine-driven propeller, which pulls the plane through the air. As a result of the forward motion, *lift* is generated by the wings, which counters the *weight*—the force of gravity trying to pull the airplane to the ground.

When the engine quits, thrust is removed from that equation. Therefore, the aircraft can't maintain level flight for long. If you pull back on the stick to maintain altitude, you lose airspeed due to air friction. To keep the airplane from stalling, you must lower the nose. Doing so results in a loss of altitude. Eventually, you run out of altitude and land—or crash.

Since all you have left when the engine quits is your altitude, you need to make the most of it. Your best bet for a safe landing is to glide as far as possible so that you'll have more landing sites to choose from. If you pitch the nose down too much, the plane will descend quickly and have a great deal of airspeed left when it gets to the ground. If you pitch the nose up steeply, you won't fly very fast or far. In the end, you'll still hit the ground.

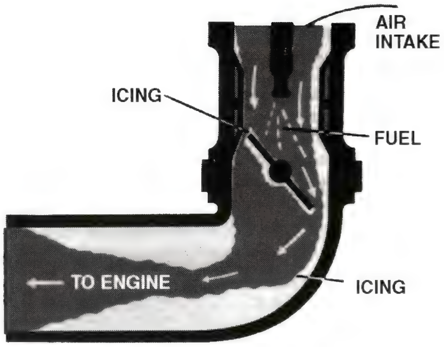


FIGURE C
Carburetor ice can lead to engine failure.

To demonstrate, let's take the Cessna up and experiment. Load up the Meigs default scenario with the Cessna selected as the aircraft type. Take off, put the gear and flaps up, fly the runway heading and climb to around 2,000 feet. Once you're level, cut the engine by pressing [F1] and make a 180-degree turn back toward the field. You'll see something like the view shown in **FIGURE D**.

Pitch the nose down and watch your airspeed climb. Maintain a speed of around 110 knots by adjusting pitch up or down with the yoke. Note how fast you lose altitude. More than likely, you'll crash into the lake pretty quickly.

Try the same scenario again, only this time maintain a speed of around 55 knots. The aircraft controls will feel "mushy," and you might hear the stall horn sound every now and again. Since flying so slowly means the nose is pitched up very high, you probably won't see much until you crash into the lake again. Notice that the altitude loss still occurs pretty quickly.

Try it once again, only this time maintain a speed between 72 and 80 knots. Notice that you'll actually get close to land. You might even make it to the runway. This is because the glide angle you have chosen maximizes your glide distance.

During an actual engine-out emergency, you don't have time to experiment with different speeds and their corre-

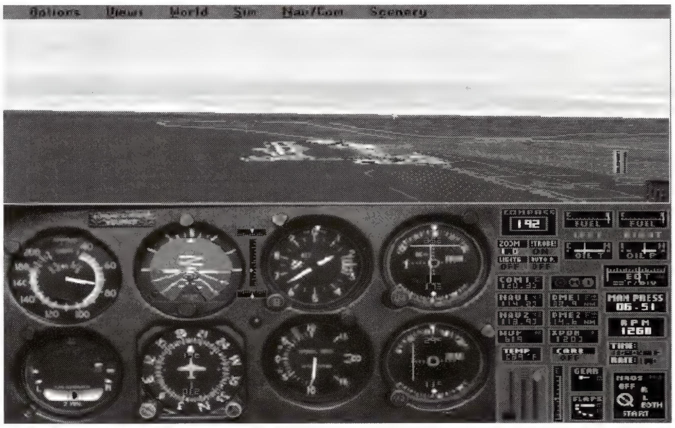


FIGURE D
Can you make it back to Meigs after your engine failure?

sponding pitch angles to maximize glide. Fortunately, the Cessna designers have already determined the best angle to use. This angle will vary depending on flap settings, but in the Cessna 182 it's the angle that results in a speed of around 80 knots for clean cruise or 65 knots for full flaps.

When the engine fails, it is extremely important to put the airplane at the proper glide angle as quickly as possible. A few seconds spent at a higher or lower glide angle can mean the difference between crashing in a forest or landing on a convenient road.

Another step that you must perform quickly is to point the aircraft in the direction of a suitable landing site. Spending time flying away from a road, field or landing strip reduces your chances of making it down safely.

Once you've established the proper glide angle and are flying toward an emergency landing location, you can start to troubleshoot the engine problem, if time permits. If you're close to the ground, it's best to simply assume that the engine can't be restarted and prepare for a forced landing.

the runway behind

Let's try another example. Again, start at Meigs in the Cessna. Take off with full throttle and climb to around 1,000 feet at an airspeed of around 90 knots, as shown in **FIGURE E**. Leave the landing gear down for now. Once at altitude, press [F1] to cut the engine. As soon as you cut the engine, turn to the right as quickly as you can to head back toward the field.

You will notice that as you turn steeply, your airspeed will drop. To keep from stalling, you'll have to lower the nose in the turn. Doing so will cause the aircraft to lose altitude quickly. By the time the turn is complete, most of your altitude will be gone. Even if you manage to get turned back around, the angle to the runway will be bad, requiring more turns and more altitude. You will find it difficult, if not impossible, to land on the runway in a controlled fashion.

Even though the runway seems to be temptingly close, the lack of altitude and airspeed, combined with the required steep turn, effectively puts it out of reach. The steep turn requires a great deal of energy, which can be obtained only by giving up altitude. In most cases, the best procedure is to try and land straight ahead (or as close to straight ahead as possible) in a controlled fashion, rather than risking a stall close to the ground in a steep turn.

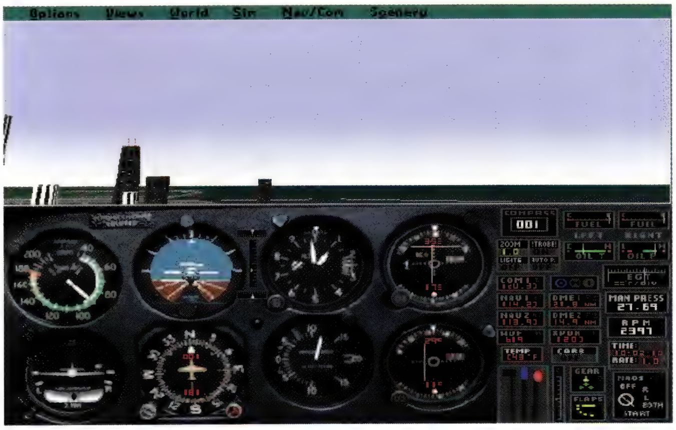


FIGURE E
There's never a good time to lose your engine, but now would be especially bad.

Of course, since Meigs is almost completely surrounded by water, your options are limited—you can either splash down in Lake Michigan or tangle with rush-hour traffic on Michigan Avenue. That's one of the reasons student pilots are restricted from flying at Meigs Field. If you're going to practice engine-out situations, Champaign's Willard Airport is a good choice, as it's surrounded by farmland.

a normal landing

If your engine quits in the traffic pattern (the rectangular pattern flown around the runway before landing), you can usually make a safe landing. During the downwind portion of the pattern (in which the aircraft is flying parallel to but in the opposite direction of landing), engine power is usually reduced to idle in preparation for landing. If an engine quits at this point, you can still make a near normal landing.

No matter where the engine failure occurs, it's important to remember to use flaps and landing gear where appropriate. Flaps slow the aircraft to a manageable speed in preparation for landing. If a failure happens near the runway, it's easy to make the mistake of trying to hoard altitude and airspeed. Skidding off the end of the runway into the lake is just as bad as landing short of the runway.

practice, practice, practice

Try various emergency landings by cutting the engine during different portions of the flight. Here's a basic emergency checklist to follow when an engine failure occurs:

1. Adjust pitch for best-glide airspeed:
   80 knots (engine fails in flight)
   65 knots (engine fails after takeoff or with flaps down)
2. Turn toward a suitable landing site

If time permits, adjust instruments to these settings:

3. Carburetor heat: ON (press [H])
4. Mixture: RICH (press [Ctrl][Shift][F4])
5. Magnetos: ON/BOTH (press [M], then press [+] until BOTH is displayed)

Just before you land, adjust instruments to these settings if time permits:

6. Mixture: IDLE/CUTOFF (press [Ctrl][Shift][F1])
7. Magnetos: OFF (press [M], then press [+] until OFF is displayed)

flying a rock

If you're flying the Learjet, you can set Flight Simulator to realistically simulate engine failure at higher altitudes. To do so, choose the Realism and Reliability... command from the Sim menu. At the bottom of the resulting dialog box, you'll see a Flameout check box, as shown in **FIGURE F** on the next page (this box is dimmed if you aren't flying a jet).

After you select this check box, you engines might fail at high altitudes where the air is too thin for the turbofan engines to use. (The Realism and Reliability dialog box also contains a check box to determine if your airplane's engines will stop when they're out of fuel.)

When engines fail in a jet, the aircraft falls quickly to the ground. This is because jet aircraft are designed to fly efficiently at high speeds. The wings are usually smaller, which results in less lift. Stall speeds are usually higher. Control requires more nose-down pitch, which means the jet loses altitude quickly.

You probably don't have access to operating handbooks for the Learjet, but you can still have fun experimenting. The stall speed for the Learjet is around 96 knots with full flaps and gear down. Let's experiment to determine the best glide speed for the Learjet.

test pilot

Load up the default Meigs scenario, but change the aircraft type to the Learjet. Tune the NAV1 radio receiver to 113.9, which is the frequency for the VOR located at O'Hare. Change the VOR1 OBI to a 270-degree heading. This will allow us to track the 270-degree radial. The Learjet's Electronic Flight Information System (EFIS) automatically provides the Distance Measuring Equipment (DME) information showing us the distance to the VOR beacon.

Depart Meigs in the Learjet. To take off without running out of runway, you'll have to use full flaps and pull the nose up very close to the end of the runway. Put the gear and flaps up once you're climbing, and reduce the throttle to about half. Climb to around 3,000 feet and adjust the throttle to keep the speed to around 200 knots.

The needle on the VOR1 OBI should be pegged to the right. Watch the needle closely. As soon as it starts to move toward the center, bank the aircraft to the left. When the directional gyro gets to around 230 degrees, roll out of the turn. Turn left or right slightly until your heading is 270 degrees and the needle on the VOR1 OBI is in the middle of the small circle in the center, as you can see in **FIGURE G**. Press [P] to pause the scenario.

Since you're going to crash the plane a few times in this experiment, you might want to activate FS5's crash analysis function. Choose the Crash Detection... command from the Sim menu. In the resulting dialog box, click on the Detect Crash and Show Graph radio button and then click OK. When you crash, FS5 will present a graph showing your aircraft's flight path in its last few seconds of flight and its speed on impact.

Save the scenario here so that you'll have a consistent place to start. Just select the Save Situation... command from the Options menu (or press the [;] key) and give the new situation an appropriate name, such as "Flameout," in the resulting dialog box.

Press [P] to resume the scenario. Now press [F1] to cut your engine. Quickly pitch the nose up to establish an airspeed of around 150 knots. Maintain this airspeed until the plane crashes. When the crash occurs, note how far away you were from the VOR by looking at the DME1 display. Jot this number down, along with the airspeed you maintained.

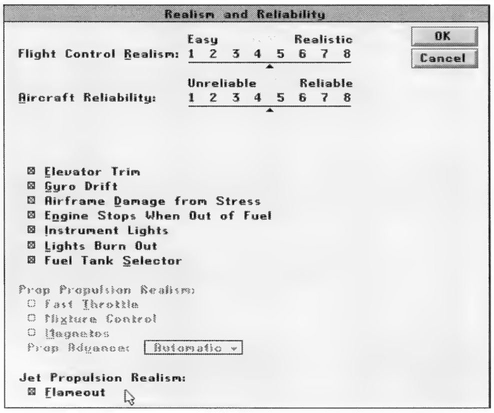
Reset the scenario and try another airspeed. By trying different airspeeds, you'll eventually narrow your choices down to the best glide speed for the Learjet. It's important to use *exactly* the same technique for each trial. When you initially pull the nose up to establish the glide, it's okay if you gain altitude. More altitude gives you more options.

Let us know what airspeed you find by faxing us a copy of your results. Make sure you also provide your name, address and daytime phone number. Five randomly drawn respondents will receive *Full Throttle* coffee mugs. We'll report the results in a future issue of *Full Throttle*.

other disasters

If you'd really like a challenge, try doing a combined engine and light failure at night. Perform the same steps described above to cut your engine, only this time set the time of day to night and turn off all lights by pressing the [L] key. Without lights, it's very difficult to see the instruments to adjust airspeed.

Try performing the emergency procedures with various instruments disabled, such as the airspeed indicator or the altimeter. A great deal of luck and skill are required to land the aircraft safely in these situations, but it can be done. Just never stop flying the plane!


Realism and Reliability

Flight Control Realism: Easy 1 2 3 4 5 6 7 8 Realistic
Aircraft Reliability: Unreliable 1 2 3 4 5 6 7 8 Reliable

☒ Elevator Trim
☒ Gyro Drift
☒ Airframe Damage from Stress
☒ Engine Stops When Out of Fuel
☒ Instrument Lights
☒ Lights Burn Out
☒ Fuel Tank Selector

Prop Propulsion Realism:
☐ Fast Throttle
☐ Mixture Control
☐ Magnetos
Prop Advance: Automatic

Jet Propulsion Realism:
☒ Flameout

FIGURE F
The Flameout setting can cause your Learjet's engines to fail at high altitudes.

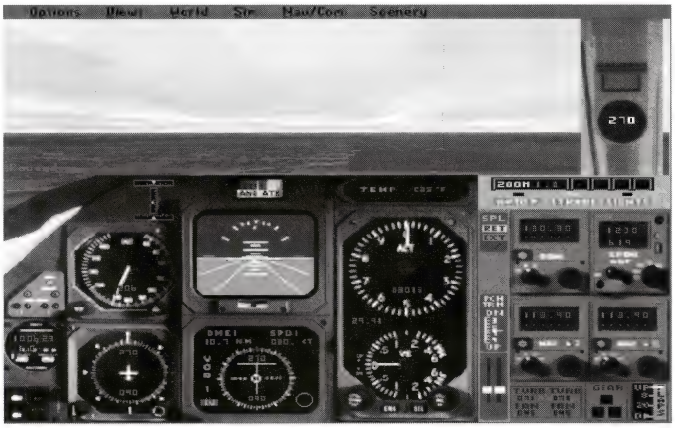


FIGURE G
We'll try to find the best rate of glide for the Learjet from this point.

CROSS COUNTRY *by Alfred Poor*

Wedding cake blues

Los Angeles—City of Angels! City of Lights! And City of Freeways! Stories abound of monumental traffic jams on the asphalt maze that makes up the L.A. road system—who hasn't heard at least one account of the overcrowded driving conditions of Southern California?

The ground-bound citizens may not realize it, but the situation in the air over the greater Los Angeles area is no less crowded than it is on the ground. Due to controlled airspace, as well as standard routes for commercial airliners that serve the major airports in the region, and operations from a handful of military air bases, a lowly little VFR bugsmasher may find it difficult to plot a route that goes from here to there without busting an FAA regulation or meeting another pilot face to face at 3,000 feet.

Undaunted by this challenge, we have decided to help you thread the eye of this needle and have planned a flight that cuts right through the middle of some of the busiest airspace in the country. So put your head on a swivel, dust off your altitude control skills (because you're going to need them!) and get ready to go flying.

from the island to the mountain

When "Cross Country" last flew in the Los Angeles basin, it was a flight from McClellan-Palomar Airport to the island of Catalina ("Island Adventure," in the June/July 1994 issue). Picking up where we left off, this flight will start at Catalina. Your destination is El Monte Airport, just 45 nautical miles (direct) from Catalina; you could simply head straight for the mountains and you'd come out close to your destination. But flying direct is not a practical option.

As with every "Cross Country" flight, we lay out the route so that you will comply with all FAA regulations (or at least as much as possible). We assume that you'll be able to use your radio to talk to the control tower at your departure and destination fields, but we try to pick routes that do not require that you contact Air Traffic Control in order to fly through controlled airspace en route.

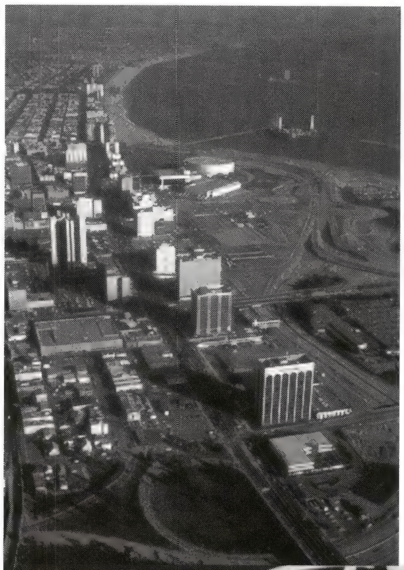
FIGURE A on page 16 shows a portion of the Los Angeles sectional chart. Most of the blue and magenta lines indicate the borders of controlled airspace. The marks are extremely crowded; if you want to see them in a more legible format, we strongly recommend that you get a copy of the Los Angeles Terminal Area Chart (TAC), which uses a larger scale and provides greater detail than the sectional. Another advantage of the TAC is that it has special VFR corridors printed on the reverse side, making it easier to find your way.

One of the main obstacles in your way is the Los Angeles Class B airspace (formerly known as a Traffic Control Area, or TCA). Right around Los Angeles International (LAX), this area extends from the ground to 12,500 feet MSL. As you get further from the airport, the "floor" of the airspace rises, first to 2,000 feet MSL, then 2,500, then 4,000. The limitations are shown in hundreds of feet, the ceiling listed above the floor with a horizontal line separating the two numbers.

These sections are loosely based on concentric rings centered on the airport, so a cross-section looks a little like a wedding cake placed upside-down on the airport. Since you need clearance to enter the Class B airspace, we need to find a route that either goes under one of these cake layers, or goes around the cake altogether. A direct route would take you through a section with a 2,500 foot floor, which is a little lower than we want to plan, so we need to find a different route.

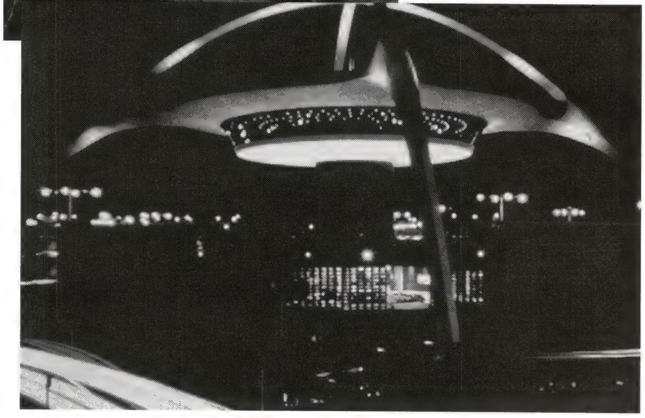
We can't send you too far to the east, however, because there's the John Wayne Orange County airport Class C airspace (which requires radio contact with air traffic control before you can enter). Portions of it have floors as low as 2,500 feet, and the tops reach up to 5,400 feet, so going over or under this airspace would probably be more trouble than it's worth.

But wait—there's more. The various airports with control towers have their own Class D airspace, which extends from



PHOTOS COURTESY LOS ANGELES CONVENTION AND VISITORS BUREAU

Our flight takes us by Los Angeles International Airport (below) and Long Beach (left).



the ground to an altitude shown in a broken box. For example, the top of this zone is at 2,600 feet over Long Beach airport and 2,500 feet over Los Alamitos AAF. We'll need to find a route that avoids these as well.

The solution is to climb to 2,800 feet after taking off from Catalina and fly right over Long Beach airport. This altitude is a little low for the water crossing, but you will be crossing under IFR routes that start at 3,000 feet.

After you pass Long Beach airport, you will turn right. The VFR portion of the Los Angeles TAC shows that you could follow the Riverside Freeway at this point, but this road is not included in the FS5 default scenery, so you'll have to just follow a compass heading. The 2,800-foot altitude will give you just a 200-foot clearance above the Long Beach Class D zone, and you'll be under a portion of the LAX Class B airspace that has a floor of 6,000 feet.

If you didn't make the right turn at this point, you would have to descend to get under the 2,500 floor of the LAX Class B airspace, but that would be tricky to do since you would almost certainly have to clip the top of the Long Beach Class D zone to get down in time. Instead, we'll head you east for a bit, until El Monte is directly off to your left. You can then turn and head for the airport, traveling under a section of the LAX Class B that has a 4,000-foot ceiling. All that you have left to do then is start your descent in time to enter the traffic pattern for a landing at El Monte.

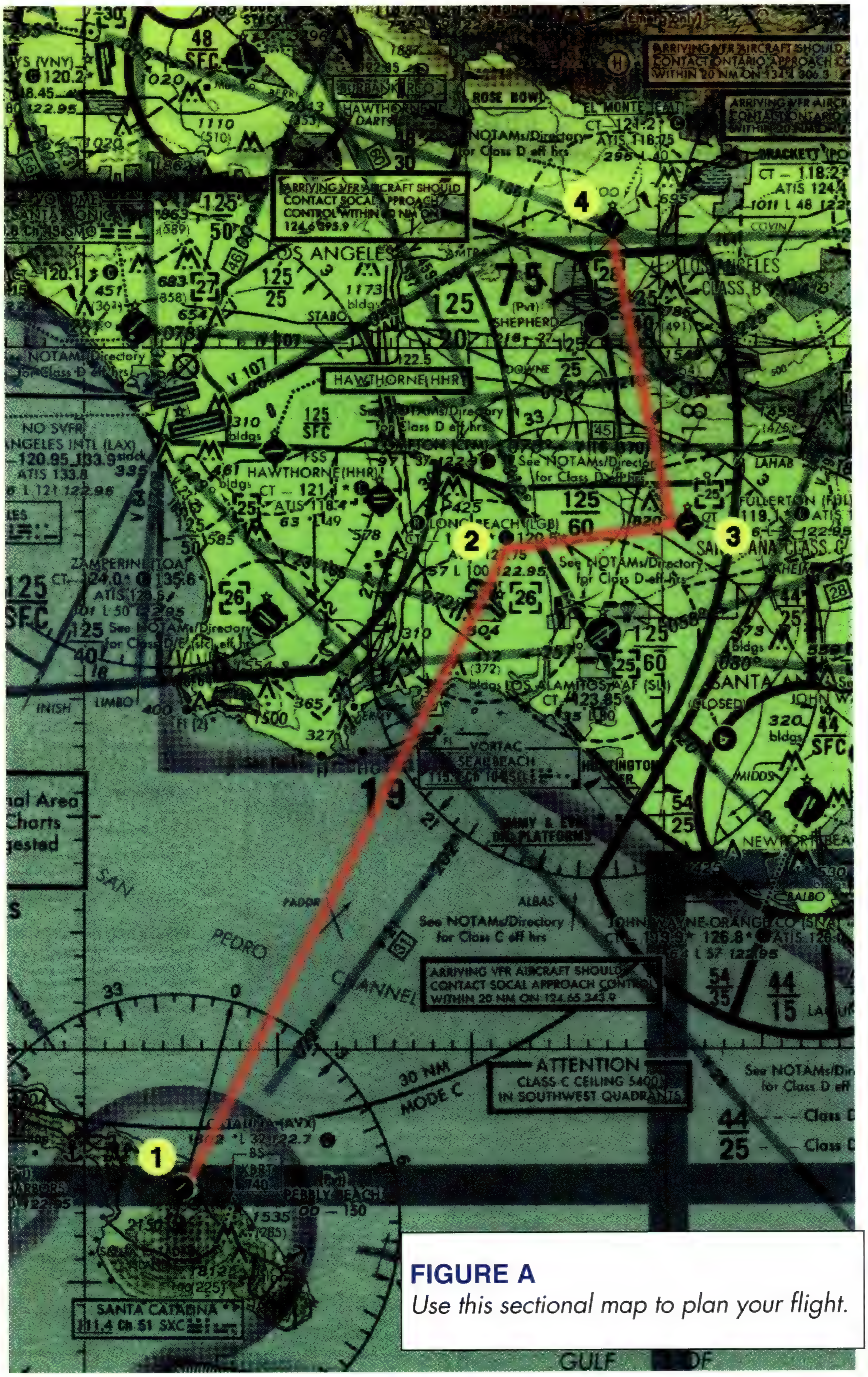


FIGURE A
Use this sectional map to plan your flight.

naviguessing

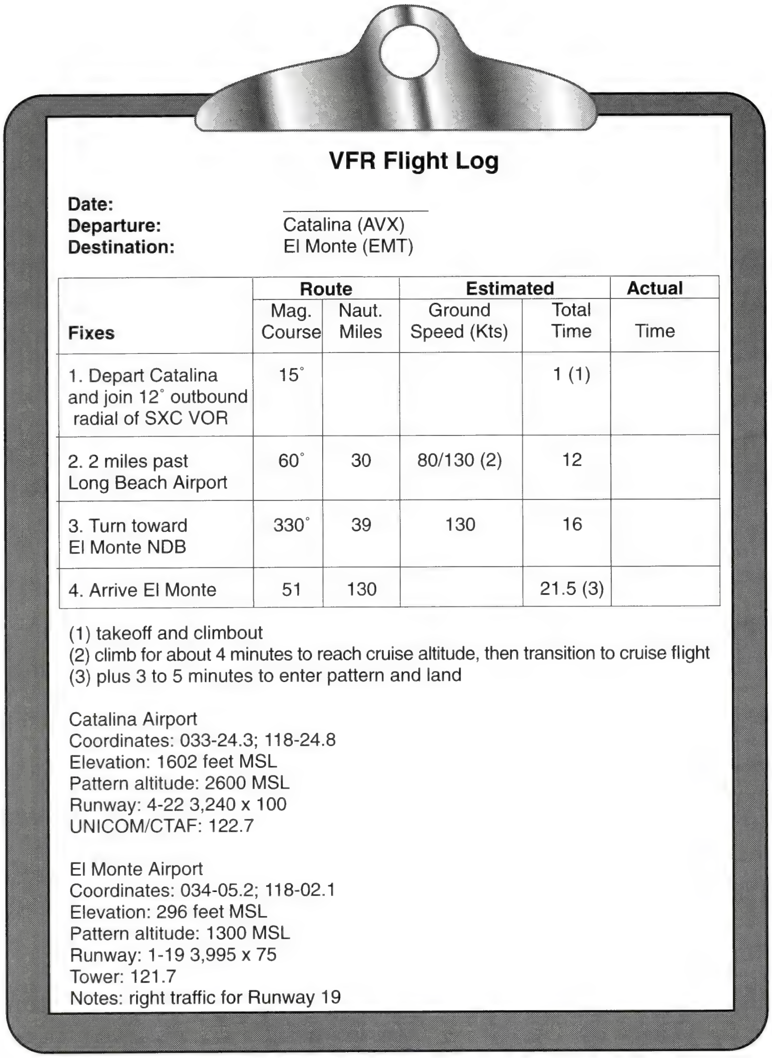
By about this point, you may be wondering just how you're going to be able to find your way through this maze of restrictions, especially if you don't have visual references like the Riverside Freeway to guide you.

The answer is that you will use a combination of three different navigating techniques. For the first leg, you will use a VOR beacon as a guide. For the second leg, you'll use old-fashioned ded reckoning ("ded" is short for "deduced"). And for the final leg, you get to home in on a non-directional radio beacon (NDB) on the field at El Monte. The three legs are detailed for you in the flight log, shown in **FIGURE B**.

The VOR for the first leg is the Catalina VOR, located about a mile and a half from the airport. By tuning the Omni-Bearing Selector (OBS) to a 12-degree heading, you can fly the outbound radial, which will take you straight over the Long Beach airport. We'll assume that you're flying in calm conditions and that you will take off from Catalina using Runway 4.

As soon as practical, go to a cruise climb (about 80 knots at full throttle) and fly the runway heading until the VOR needle centers on the gauge. Then turn to a 12-degree heading and keep the needle centered. Don't forget to level off at 2,800 feet, and then throttle back and trim your aircraft for straight and level flight at 130 knots at that altitude. You'll want to get the trim settled down before you make landfall, because you will be busy navigating and don't need to worry about busting an altitude at the same time.

You will pass over the Long Beach airport when the DME read-out for the Catalina VOR reads about 29 miles. (Note: In some of our test flights, the scenery for Long Beach did not appear; instead, it remained a rectangular gray patch next to a freeway. This display quirk may be caused by a low-memory condi-



VFR Flight Log

Date:
Departure: Catalina (AVX)
Destination: El Monte (EMT)

	Route		Estimated		Actual
Fixes	Mag. Course	Naut. Miles	Ground Speed (Kts)	Total Time	Time
1. Depart Catalina and join 12° outbound radial of SXC VOR	15°			1 (1)	
2. 2 miles past Long Beach Airport	60°	30	80/130 (2)	12	
3. Turn toward El Monte NDB	330°	39	130	16	
4. Arrive El Monte	51	130		21.5 (3)	

(1) takeoff and climbout
(2) climb for about 4 minutes to reach cruise altitude, then transition to cruise flight
(3) plus 3 to 5 minutes to enter pattern and land

Catalina Airport
Coordinates: 033-24.3; 118-24.8
Elevation: 1602 feet MSL
Pattern altitude: 2600 MSL
Runway: 4-22 3,240 x 100
UNICOM/CTAF: 122.7

El Monte Airport
Coordinates: 034-05.2; 118-02.1
Elevation: 296 feet MSL
Pattern altitude: 1300 MSL
Runway: 1-19 3,995 x 75
Tower: 121.7
Notes: right traffic for Runway 19

FIGURE B
This flight log will help you chart your progress.

tion.) Continue two miles past the airport, until the DME reads about 31 miles or until you can see the airport out the back window of your Cessna.

The second leg starts with a right turn to a magnetic heading of 60 degrees. This takes you along the edge of the LAX Class B airspace that has the low floor, with plenty of room to spare. There are no landmarks you can use for this leg (though you will be flying directly to Fullerton Airport, but this airport is not included in the default scenery).

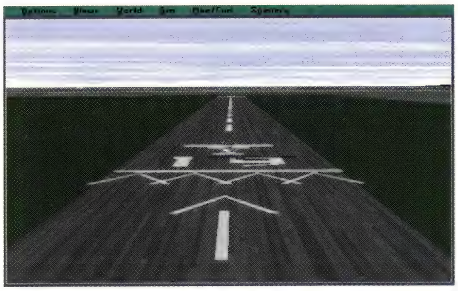


FIGURE C
You need to aim for a touchdown point beyond the displaced threshold.

You will make your turn onto the third leg based on the El Monte NDB radio beacon, using your ADF (automatic direction finder) gauge. (You display the ADF gauge in place of the NAV2 OBI by selecting the ADF... command from the Nav/Com menu and selecting the ADF check box.) The ADF arrow always points to the beacon. So you will fly on your 60-degree heading until the ADF arrow points to 270 degrees, indicating that El Monte is to your left at a right angle. Turn to a 330-degree heading, and continue on until you see the airport.

This third leg is about 12 nautical miles long, and you will need to descend to 1,300 feet by the time you reach the airport so that you are at pattern altitude when you get there. Since you will be cruising at 2,800 feet, that means you must lose 1,500 feet, which will take three minutes at a typical 500-feet-per-minute descent rate. You will be traveling at 130 knots, so you will need to start your descent at least 6.5 miles from the airport. Plan on starting down (by reducing your throttle) a minute after you make your turn onto the third leg.

Once you arrive at the airport, assume that the tower clears you to enter a right downwind for landing on Runway 19 and then clears you to land. This means you will fly past the near end of the runway when you reach the airport, then turn to parallel the field with it off your right side. Turn base and final and set up for your landing.

There's one more surprise lurking for you. When you are on final approach, you will see that there are some arrows painted at the start of the runway, as you can see in **FIGURE C**. These indicate a *displaced threshold*; you may not land on this section of the runway. So keep the plane in the air until after you pass over the solid line that indicates the start of the landing zone. (You are permitted to use a displaced threshold for take-off runs, however.)

getting ready to fly

You can use the Airports dialog box under the World menu to go directly to Catalina. Choose the USA - Los Angeles

(continued on page 21)

NOTAM: Landing hazard reported at Catalina

We have received numerous PIREPs (Pilot Reports) of difficulties when landing or taking off at Catalina. You set up for a perfect full-stall landing and then BAM! Your plane either crashes or falls through the runway and into the depths of Catalina Island.

The most frustrating part of the problem is that it doesn't happen every time. One theory is that the problem is related to where on the runway you happen to touch down. As yet, we have not been able to come up with a definitive solution, so use caution when landing at Catalina (or just turn off crash detection when landing there).

Top tech support questions

Harry Emil, a technical support engineer for Microsoft Flight Simulator 5, provided us with this list of the questions that tech support is asked to answer most frequently. If you've been having a problem with FS5, a quick look at this list could save you the time and long-distance charges of a call to technical support.

Q Why do I get the error message Fatal Error 0039/+00939 during Flight Simulator setup on my Pentium computer?

A This has been corrected in the Flight Simulator 5.0a maintenance release, which is available from the Microsoft Download Service (MSDL) as well as directly from Microsoft. To obtain version 5.0a from MSDL, download FS500A.EXE, which updates Flight Simulator 5.0 to the 5.0a version. The number for the MSDL is (206) 936-6735. This service is available 24 hours a day, 7 days a week. The highest download speed available is 14,400 bits per second (bps). Each file is a compressed, self-extracting file. After you download the file FS500A.EXE, run it in an empty directory to extract the files it contains.

If you do not have a modem to connect to MSDL, you can work around the Fatal Error 0039/+00939 problem by performing the following six-step procedure.

1. Switch to the C:\FLTSIM5 directory in MS-DOS.

2. Make a backup copy of the file VGB.GRA by entering *COPY VGB.GRA VGB.BAK.*

3. Type *DEBUG VGB.GRA* and press [Enter]. You will see a hyphen (-) prompt.

4. Type the following:

```
e cs:429a f8
```

and press [Enter]. You'll return to a hyphen (-) prompt.

5. Type *W* and press [Enter]. The computer will return the message Writing 0E18E bytes.

6. Type *Q* and press [Enter] to quit.

Q I get the message *EMM Exception Error #12* when I run Flight Simulator. How can I correct this problem?

A If you are using the POWER.EXE power management utility, you will encounter this problem. To correct the problem, you can either remove the POWER.EXE statement from your computer's AUTOEXEC.BAT file or you can create a Flight Simulator boot disk. To create a Flight Simulator boot disk, follow the instructions on the inside back cover of the FS5 *Pilot's Handbook.*

Q I sometimes have trouble with the sounds FS5 plays through my Sound Blaster 16 card. What's the best way to configure my Sound Blaster 16 to work with Flight Simulator 5.0?

A The engine sounds for the Learjet may cut in and out when you're using a Sound Blaster 16 or Sound Blaster 16 ASP sound card with Flight Simulator 5.0. This problem may occur for one of the following three reasons:

Problem 1: The High DMA channel for the sound card is set to a 16-bit channel.

Resolution: The Sound Blaster 16 and Sound Blaster 16 ASP use a High DMA (Direct Memory Access) channel as well as a standard DMA channel. Changing the High DMA channel to use the standard DMA channel may correct this problem. You change the DMA channel as follows:

a. Open your computer's AUTOEXEC.BAT file using a text editor such as the MS-DOS Editor utility.

b. Locate the line that contains the command

```
SET BLASTER=
```

c. Change the number that appears after the H parameter so that it matches the number after the D parameter. That is, you'd change the line

```
SET BLASTER=A220 I5 D1 H5
```

to

```
SET BLASTER=A220 I5 D1 H1
```

Problem 2: Your computer doesn't have enough EMS memory configured.

Resolution: Making the following changes to the Expanded Memory Manager may correct the sound problem.

a. If you are using EMM386 as your Expanded Memory Manager:

   i. Open the CONFIG.SYS file using a text editor such as the MS-DOS Editor utility.

   ii. Locate the line that reads

   ```
   DEVICE=<path>EMM386.EXE
   ```

   where <path> is the path to your EMM386.EXE file.

   iii. Modify it so that it reads as follows:

   ```
   DEVICE=<path>EMM386.EXE 2048 RAM
   ```

b. If you are using a third-party expanded memory manager, such as Quarterdeck's QEMM, consult the manufacturer's documentation on how to configure EMS memory to 2048K or more.

Problem 3: Too few EMS handles are configured, or the DMA buffer size is too small.

Resolution: Making the following changes to the Expanded Memory Manager may correct the sound problem.

a. If you are using EMM386 as your Expanded Memory Manager:

   i. Open the CONFIG.SYS file using a text editor such as the MS-DOS Editor utility.

   ii. Add the following to the end of the EMM386.EXE line in the CONFIG.SYS file:

   ```
   H=255 D=64
   ```

b. If you are using a third-party expanded memory manager, consult the manufacturer's documentation on the following topics:

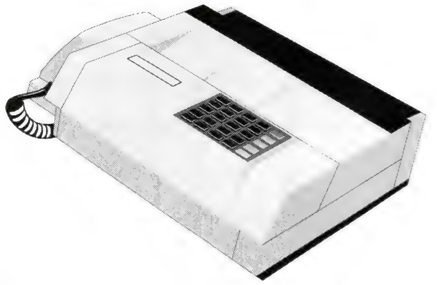
   How to increase EMS file handles (to 255)
   How to increase DMA buffer size (to 64)

Q I receive the message *Fatal Error 8027* when I run Flight Simulator 5.0. How do I fix this problem?

A This error occurs on computers using the new Intel Overdrive processors (486 DX4-100 and P24T). This problem is corrected in Flight Simulator version 5.1.

If you've been noticing one of these problems, try the solution provided here by Microsoft Technical Support. If you've been experiencing trouble of a different nature, you can call Microsoft Technical Support at the number listed at the top of page 3. Microsoft also provides free FS5 support via fax, as we describe in the article "Get Quick FS5 Help with Microsoft's Fax Service," below.

Get quick FS5 help with Microsoft's fax service



Flight Simulator 5 users may find themselves with questions from time to time regarding problems that crop up with their copy of the program. Fortunately, computer pilots can get help quickly and free of charge through a dial-up service provided by Microsoft—and those with access to a fax machine can get that information almost instantly.

Microsoft provides answers to a number of basic questions about Flight Simulator 5 quickly and easily through its toll-free FastTips service. Computer pilots can call to order any of a number of short FS5-related documents by mail or have them appear moments later on the fax machine they specify.

Let's discuss the simple procedure for using Microsoft's FastTips service. As you'll see, you simply call a toll-free number on a Touch-Tone telephone, press a few buttons on your telephone's keypad and then wait for the documents to appear on your fax machine.

basic fax

You access Microsoft's FastTips service by dialing (800) 936-4100 on a Touch-Tone telephone. When you do, you'll hear a recorded greeting and an initial menu listing the nine Microsoft product categories for which help is available. You'll press 9 on your telephone's keypad to select the Microsoft Home Products category, which includes tips for Flight Simulator 5 and Space Simulator.

If this is your first time calling the service, you'll want to begin by obtaining a few documents that'll help you navigate around the service more easily. From the Microsoft Home main menu, press 2 to order the FastTips map. From the subsequent menu, you can press 2 to listen to recorded new user information or 1 to order the FastTips map—a single page that depicts the FastTips menu structure.

After you press 1 to order the map, the recorded voice will ask if you want to order by mail or fax. If you want to obtain the documents by mail, the system will prompt you to record your name and mailing address. You will receive the documents you ordered in several days to a week.

To order by fax, enter the fax number you want to use at the recorded prompt. After you've done so, the voice reads the number back to confirm you've entered it correctly. You then have the option of appending a name or extension number if doing so will ensure proper delivery of the fax. Adding a name or extension does take considerably more time, so you'll want to skip this step if at all possible.

Once you've confirmed the fax number, you can simply hang up and wait for the FastTips map to appear on your fax machine. The service is designed so that you can use it even if your fax and voice phone share the same line—you call to place the order, then hang up and let your fax machine answer the subsequent incoming call.

But you don't need to end your call after ordering the map. While you have the FastTips service on the phone, go ahead and order the complete catalog of documents available for Microsoft Home products. Just press the pound key (#) to return to the main menu. From the main menu, press 3 to enter the technical information menu.

In the technical information menu, press 1 to enter the technical library and then 1 again to order the nine-page FastTips catalog. From this menu, you can also press 2 to order items from the catalog if you've already received it or press 3 to listen to descriptions of various documents and order any you find interesting. If you've already entered a fax number on this call, you won't have to do so again.

Once your fax machine spits out the FastTips map and catalog, you're armed with all the information you need to access FS5 information in the shortest possible time.

FS5 fax

Now that we've told you how to use the FastTips service most efficiently, let's look at how to use the system to obtain information on FS5.

Microsoft FastTips service

Phone: (800) 936-4100

Key	Action
Navigation keys	
* (star)	Skip ahead
# (pound)	Main menu
5	Pause message
7	Repeat message
0	Help
Product Menu keys	
1	Microsoft Office
2	Microsoft Word
3	Microsoft Excel
4	Microsoft Access
5	Microsoft PowerPoint
6	Microsoft Project
7	Microsoft Works
8	Microsoft Publisher
9	Microsoft Home Products (including Flight Simulator 5)
Main Menu keys	
1	Express catalog order service
2	FastTips map and new user information
3	Technical information
4	Microsoft support network and customer service information
5	Microsoft Download Service information

Let's first order the common question-and-answer document that covers Flight Simulator 5 and Space Simulator. As we describe in the article "Top Tech Support Questions," on page 18, Microsoft's product support service compiles this list of frequently asked questions to disseminate information that can help computer pilots solve problems more efficiently.

As before, dial the FastTips toll-free number and press 9 at the initial prompt. From the Microsoft Home main menu, press 3 to enter the technical information library. At the prompts that follow, press 2 to enter the question-and-answer service and then press 3 to enter the simulation products subsection. You can then listen to recordings of answers to ten frequently asked questions about Flight Simulator 5 and Space Simulator. You can also order a printed copy of the information by mail or fax at any time.

But suppose we have a question that isn't covered in the frequently asked questions section—let's say it's about FS5's Land Me feature. A quick glance at the catalog reveals a document numbered 111066 whose title is "Land Me Does Not Work at All Airports." Sounds promising—let's order it and see if it sheds any light on our question.

From the Home Products main menu, just press 1 to enter the express catalog order service. At the prompt, enter the four- or six-digit number of the document you want—in this case, 111066. The service will read back the number to confirm; you can then order additional documents or hang up and await the incoming fax. The Land Me document should appear on the fax machine a few minutes later. It explains that the Land Me feature works only within about 60 nautical miles of an airport that supports it.

By the way, many of the text files you can listen to or order are also available on the Flight Simulator section of the Microsoft Knowledge Base on CompuServe (GO MSKB).

other FastTips services

FastTips also provides a toll-free method of getting detailed information about Microsoft's comprehensive product support systems. For example, by pressing 4 at the main menu prompt, you can obtain information that describes Microsoft's telephone product support and customer service centers. There's even a prompt that provides a recording of basic service and support questions and answers.

By pressing 5 at the main menu prompt, you can order or listen to information about the Microsoft Download Service (MSDL). You can use this service to obtain FS5-related files, such as the FS 5.0a patch, via modem. MSDL charges no connect-time fee, but you will pay long-distance charges for the time you're connected.

After listening to the messages describing either service, you'll have the option of obtaining a copy of the information you just heard via fax or mail. You can also call Microsoft Technical Support at (206) 637-9308 to speak with a support specialist. The service is available from 6 a.m. to 6 p.m. Pacific time (9 a.m. to 9 p.m. Eastern). Microsoft does not charge for this servcice, but you will pay long-distance charges.

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Wedding cake blues

(continued from page 17)

scenery area, and then Avalon - Catalina - Runway 4 from the list of airports.

You then need to set your radios and other equipment. Since you are going to be flying under VFR rules, you want to make sure that your transponder is "squawking" 1200, the VFR code. Your NAV1 radio should automatically be tuned to the Catalina VOR (111.40), but you will need to adjust the OBS setting to 12 degrees. This will set up the gauge so you can intercept the radial after takeoff.

Finally, you need to set up the ADF. Choose the ADF... command from the Nav/Com menu. Enter the frequency for El Monte, which is 359, and then check the Activate ADF Gauge box. The ADF gauge will replace the second NAV gauge on the Cessna panel. Choose OK to return to your cockpit, and you're ready to fly. If you're looking for an extra challenge, set the time of day to Dusk, and pretend that you're flying home after a great day at the beach.

Los Angeles may be crowded both on the ground and in the skies, but with a little careful planning—and a lot of attentive piloting—you can wind your way through the different types of airspace and make much better time than the folks stuck on the freeways.

Alfred Poor is a licensed pilot and contributing editor for Full Throttle *and for* Computer Shopper *magazine, for which he writes the monthly "Aerodrome" column.*

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Fueling around

Fuel is the lifeblood of your aircraft. Well, actually, electrical impulses in your computer are the lifeblood of your aircraft in Flight Simulator 5, but if those electronic impulses signal you're out of fuel, you're still in big trouble.

Just as in the real world, you need to carefully monitor your fuel consumption in FS5 and land at a properly equipped airstrip for refueling when your tanks get low. Fortunately, aviation fuel, or *avgas*, is free in FS5—a welcome departure from real-world accuracy.

In this article, we'll discuss FS5's fuel systems and how you can configure them to display realistic fuel consumption or to disregard fuel entirely. We'll also show you the various ways you can refuel your aircraft.

fill 'er up

One of the first things a pilot does before taking a plane up is check the fuel. Indeed, checking the fuel supply is one item that's always near the top of a pilot's checklist, even before a short flight. After all, a pilot can't just pull over to the nearest convenience store for a quick couple of gallons the way a driver can.

In the default Meigs Field situation, your Cessna is fully fueled and ready to go. You take off and head out on a long cross-country. When you arrive, you'll want to refuel your plane for the return trip. In the real world, you'd just leave your credit card with the FBO while a fuel truck drives over to fill your Cessna with 100-octane low lead. In some cases, refueling is even easier in FS5.

Some airports, including Meigs, come equipped with an automatic refueling area. It looks like a yellow square painted on the ground with a large yellow letter F inside. You can see the refueling area at Champaign Willard Airport in **FIGURE A**.

All you have to do is taxi your plane onto the square and brake to a full stop. FS5 automatically resets your fuel tanks to full capacity. In an instant, you're ready to grab some more sky!

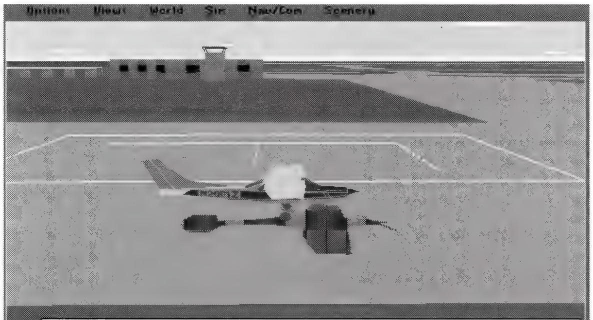
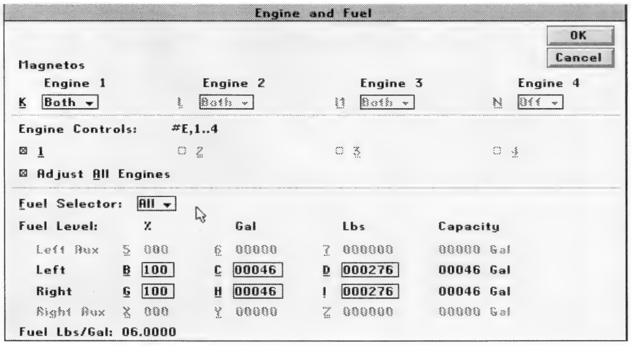


FIGURE A
You just taxi onto the yellow square for FS5 to refuel your plane automatically.

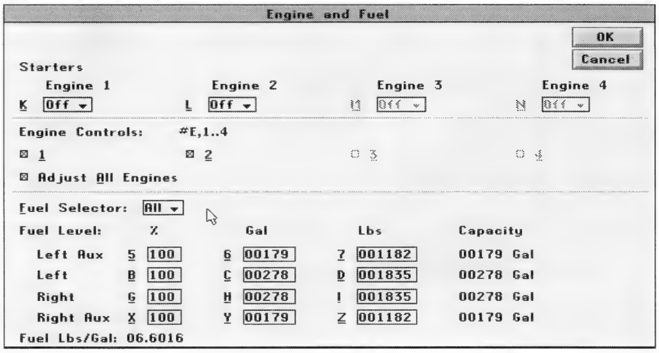
But not all airports come equipped with this convenient fuel box. You can still top off your tanks at these airports (and indeed, at any time in a flight session) by using an FS5 menu command. Just choose the Engine and Fuel... command from the Sim menu. In the resulting dialog box, you'll see a series of Fuel Level text boxes that let you set the amount of fuel you want to carry on a given flight. **FIGURE B** shows the Engine and Fuel dialog box as it appears for single-engine planes such as the Cessna or Sopwith Camel; **FIGURE C** shows the same dialog box for the Learjet. Note that the Learjet has dual engine controls and allows you to carry fuel in the wingtip auxiliary tanks.

Both dialog boxes note the weight of the fuel and calculate the weight, percentage or number of gallons based on the amount you enter in one of the text boxes. For example, as you can see in **FIGURE B**, if you enter 100 in both percentage text boxes, FS5 calculates that you're carrying 46 gallons of fuel weighing 276 pounds in each tank. Note that the jet fuel the Learjet



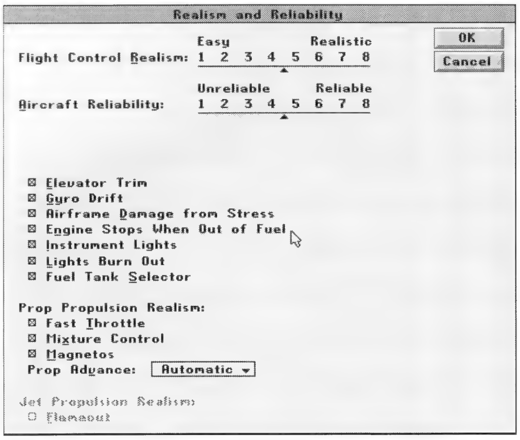
```
Magnetos
   Engine 1          Engine 2          Engine 3          Engine 4
K  Both ▾         L  Both ▾         M  Both ▾         N  Off ▾
Engine Controls:   #E,1..4
☒ 1               ○ 2               ○ 3               ○ 4
☒ Adjust All Engines
Fuel Selector: All ▾
Fuel Level:      %          Gal          Lbs          Capacity
  Left Aux    5  000     6  00000    7  000000     00000 Gal
  Left        B  100     C  00046    D  000276     00046 Gal
  Right       G  100     H  00046    I  000276     00046 Gal
  Right Aux   X  000     Y  00000    Z  000000     00000 Gal
Fuel Lbs/Gal: 06.0000
```

FIGURE B
You can use this dialog box to refuel your single-engine plane manually.



```
Starters
   Engine 1          Engine 2          Engine 3          Engine 4
K  Off ▾          L  Off ▾          M  Off ▾          N  Off ▾
Engine Controls:   #E,1..4
☒ 1               ☒ 2               ○ 3               ○ 4
☒ Adjust All Engines
Fuel Selector: All ▾
Fuel Level:      %          Gal          Lbs          Capacity
  Left Aux    5  100     6  00179    7  001182     00179 Gal
  Left        B  100     C  00278    D  001835     00278 Gal
  Right       G  100     H  00278    I  001835     00278 Gal
  Right Aux   X  100     Y  00179    Z  001182     00179 Gal
Fuel Lbs/Gal: 06.6016
```

FIGURE C
You use this dialog box to control the fuel systems on the Learjet. Notice the wingtip auxiliary tanks and the heavier jet fuel.



Realism and Reliability

Flight Control Realism: Easy 1 2 3 4 5 6 7 8 Realistic

Aircraft Reliability: Unreliable 1 2 3 4 5 6 7 8 Reliable

☒ Elevator Trim
☒ Gyro Drift
☒ Airframe Damage from Stress
☒ Engine Stops When Out of Fuel
☒ Instrument Lights
☒ Lights Burn Out
☒ Fuel Tank Selector

Prop Propulsion Realism:
☒ Fast Throttle
☒ Mixture Control
☒ Magnetos
Prop Advance: Automatic

Jet Propulsion Realism:
☐ Flameout

FIGURE D

You can control whether running out of fuel results in loss of engine power in this dialog box.

carries is about 10 percent heavier than the avgas the Cessna uses.

You could refuel your plane manually by setting both the left and right tanks to 100 percent full. You could also decrease the amount of fuel you're carrying if you're only traveling a short distance and you want to save on weight. But we recommend you follow good real-world flight procedure and keep your tanks as full as possible. Again, in the real world, it isn't always easy—or even possible—to get more fuel in case of emergency once you're en route.

In fact, you might wonder what happens if you start the default scenario and then have so much fun you don't notice the fuel draining from your wing tanks. Don't worry—you won't see any dire consequences.

By default, running out of fuel has no effect on your plane in FS5. The Realism and Reliability dialog box under the Sim menu contains a check box labeled Engine Stops When Out of Fuel, as shown in **FIGURE D**. It's fairly self-explanatory. In the default Meigs situation, in which that setting is deselected, your Cessna seemingly comes equipped with a high-tech, ultra-light fusion engine that can produce unlimited power. Running out of fuel simply has no effect on your plane.

To illustrate, we deselected the Engine Stops When Out of Fuel setting and then used the Engine and Fuel dialog box to drain our Cessna's tanks onto the tarmac. We then applied full throttle and started our takeoff roll. As you can see in **FIGURE E**, our propeller is going strong despite the fuel indicators' reading of bone-dry tanks.

that's a switch

The Engine and Fuel dialog box also contains an obscure text box that controls one of the most frequently checked controls on a light aircraft. The Fuel Selector list box allows you to select which tank you're draining fuel from. By default, it's set to All, which is exactly where it should be.

In the real world, you'd check your fuel selector at several times during the flight to ensure that the tanks are indeed set to drain equally. If you set the switch to drain one tank but not the other, you not only have half the fuel you might expect, but you're also disturbing the balance of your plane by using up the fuel in one wing—thus lightening the wing—while the other wing stays full of heavy fuel.

You might also set the Fuel Selector control to Off. Doing so in a real aircraft would almost immediately result in a *flameout*, or loss of engine power. However, if you've deselected the Engine Stops When Out of Fuel check box in the Realism and Reliability dialog box, switching the fuel off will have no effect.

keep on truckin'

By the way, just because you can't call a fuel truck over to fuel up your aircraft doesn't mean they don't exist in FS5. Bright yellow fuel service vehicles are among FS5's airport dynamic scenery. To see them, choose the Dynamic Scenery... command from the Scenery menu and make sure the Airport Service Traffic check box is selected in the resulting dialog box.

As you can see in **FIGURE F**, activating the Airport Service Traffic check box creates a number of fuel trucks that scurry around certain airports bringing fuel to the dynamic scenery aircraft (or just going on joyrides if you haven't configured FS5 to display Airport Ground Traffic).

Unfortunately, the fuel trucks won't bring you any avgas no matter how much you wave a credit card at them—they'll just ignore you. As we pointed out in the article "A Crash Course" in the February/March issue of *Full Throttle*, if you've configured FS5 to detect a crash when you hit a dynamic scenery object, you'll need to give the fuel trucks wide berth if you want to avoid a disaster.

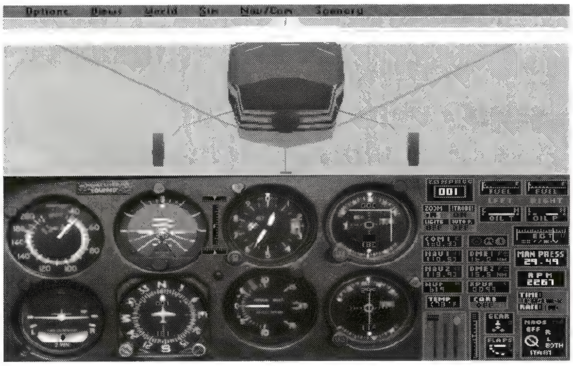


FIGURE E

Although our Cessna is out of fuel, the engine is still racing at full throttle, because we deselected the Engine Stops When Out of Fuel setting.

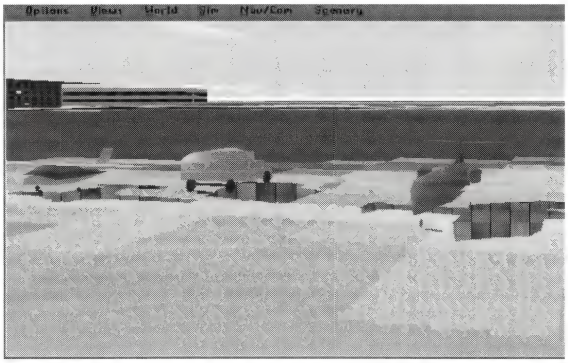


FIGURE F

If you activate the Airport Service Traffic check box in the Dynamic Scenery dialog box, you'll see fuel trucks start to scurry around some airports in FS5.

An index of *Full Throttle* articles

This comprehensive index is arranged by subject, listing the variety of topics covered in the previous issues of *Full Throttle*. We provide this index to make your subscription to *Full Throttle* more useful as a problem-solving and informational resource and to help you locate articles of interest missing from your collection. You can order back issues at the price listed on the masthead on page 3 by calling our Customer Relations department at (800) 223-8720.

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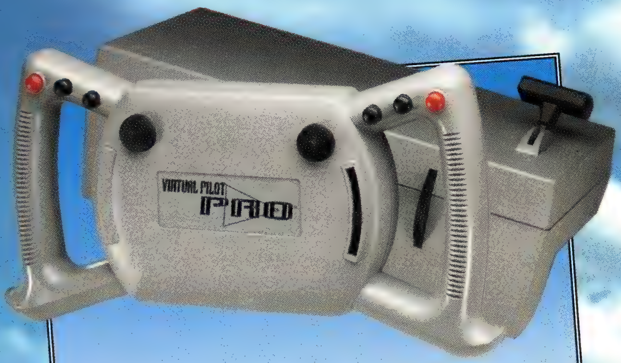

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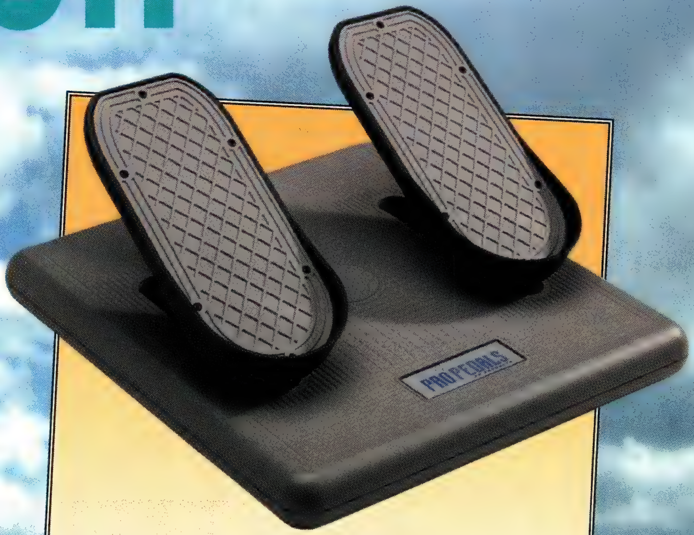

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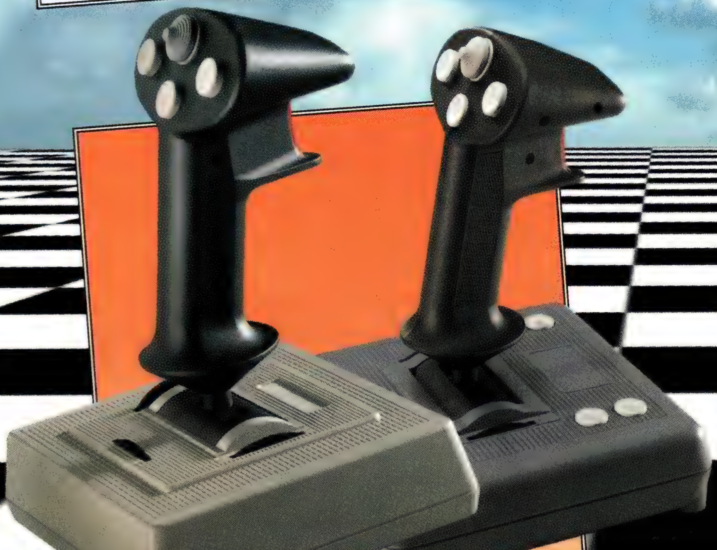

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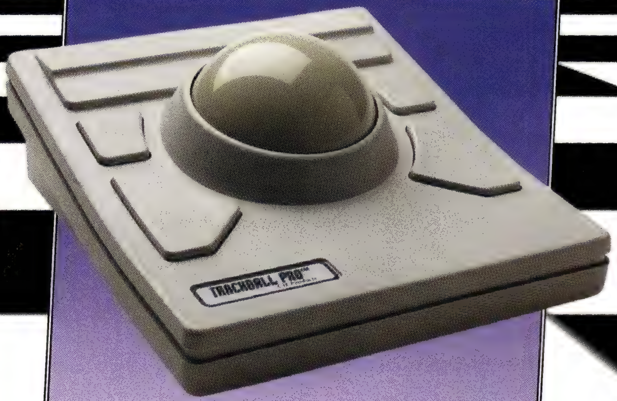

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Version 5.1 expands the Flight Simulator world

Upon its release in late 1993, Flight Simulator 5.0 immediately became one of the most sophisticated personal-computer programs of its kind, sporting virtually unprecedented detail and realism. Now a newly updated version expands these horizons by not only fixing some difficulties that appeared in version 5.0 but also adding new airports and scenery textures that contribute even more realism.

The recently released Flight Simulator 5.1 represents an enormous step by Microsoft and the designers at the Bruce Artwick Organization (BAO) in their efforts to bring highly realistic general-aviation simulation to desktop PCs. Far from merely fixing a few bugs or tweaking slight improvements out of a couple of features, the new Flight Simulator version represents a quantum leap with its stunning new textures, highly realistic weather and improved performance. And as if that weren't enough, the CD-ROM version provides even more detail in the form of major airports, roads, rivers, mountains and other landmarks worldwide.

The first difference you'll notice when you launch FS 5.1 is that the splash screen displayed at startup first presents the Microsoft Home logo and then shows the familiar Flight Simulator 5 opening screen. Now,

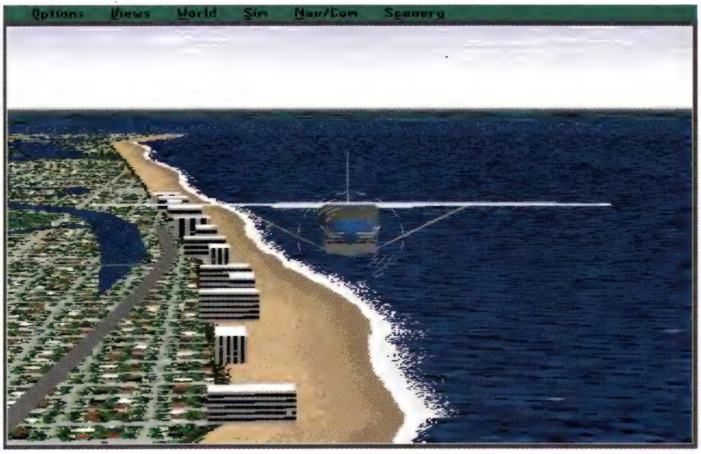


FIGURE A
The beautiful 256-color water is one of the first new features you'll notice in FS 5.1.

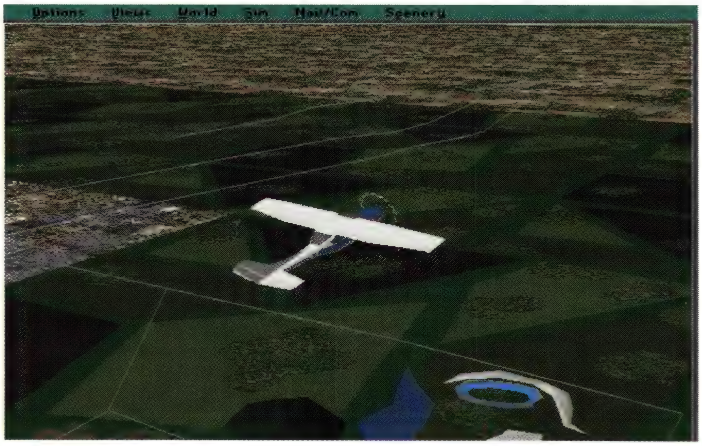


FIGURE C
The improved texture is used throughout FS 5.1's virtual world, as you can see from this view of the Munich scenery area.

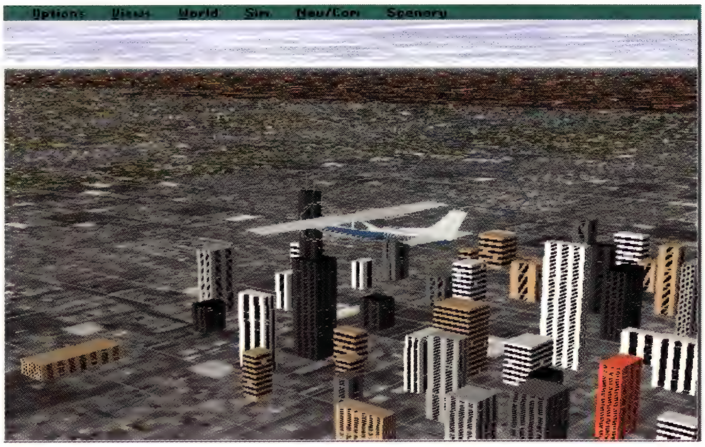


FIGURE B
The improved textures make the default scenery cities resemble those in Microsoft's add-on scenery.

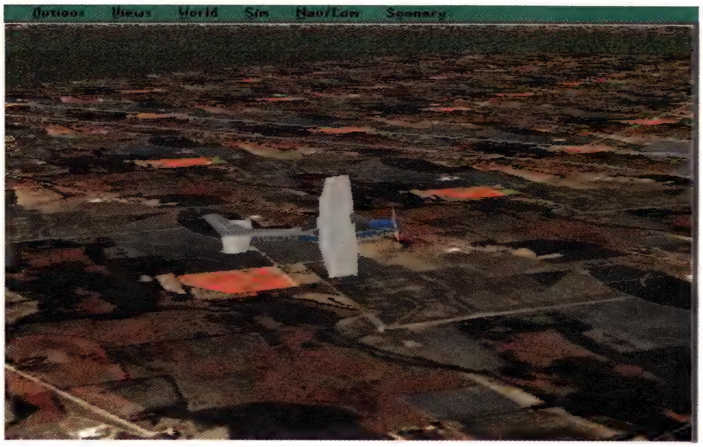


FIGURE D
Some textures change color as the seasons pass.

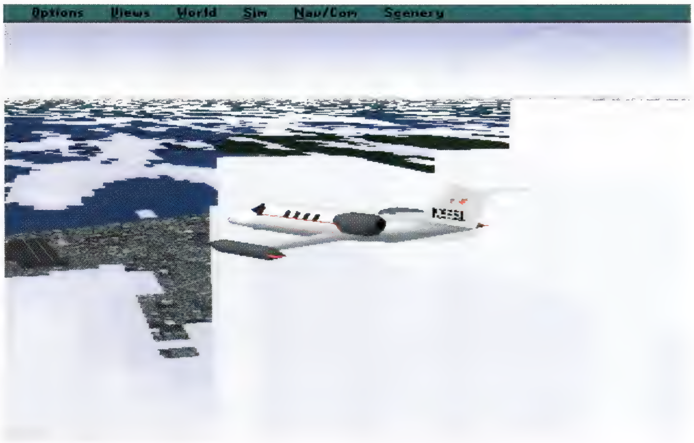
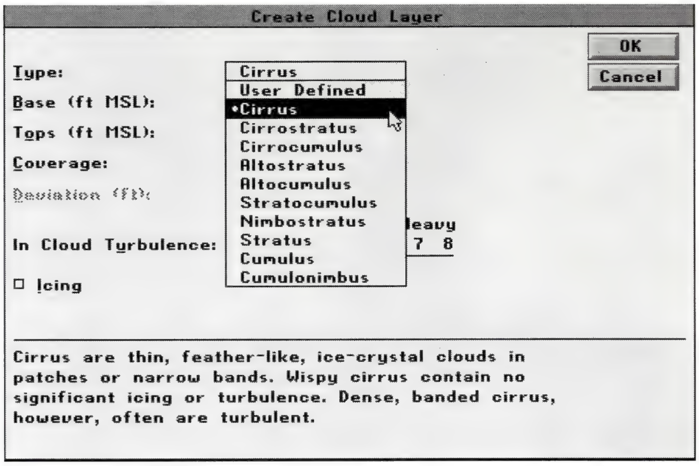


FIGURE E
FS 5.1 now sports three-dimensional cloud formations.



Type: Cirrus
Base (ft MSL):
Tops (ft MSL):
Coverage:
Deviation (ft):
In Cloud Turbulence:
☐ Icing

User Defined
•Cirrus
Cirrostratus
Cirrocumulus
Altostratus
Altocumulus
Stratocumulus
Nimbostratus
Stratus
Cumulus
Cumulonimbus

Cirrus are thin, feather-like, ice-crystal clouds in patches or narrow bands. Wispy cirrus contain no significant icing or turbulence. Dense, banded cirrus, however, often are turbulent.

FIGURE F
You can define your own cloud structures or select from a number of predefined real-world cloud types.

brace yourself for a striking series of improvements as we take a tour through Flight Simulator version 5.1.

new textures

One of the most striking differences between Flight Simulator 5.0 and 5.1 is the latter's greatly expanded use of 256-color textures that provide more attractive and realistic scenery. An immediately noticeable difference is the beautiful new water effects. As you can see in **FIGURE A** on page 27, the Microsoft Caribbean Scenery takes especially great advantage of the new water texture—you can practically hear the surf over the drone of the Cessna's Lycoming engine.

FS 5.1 also utilizes more richly detailed urban textures that provide a greater illusion of flying over a metropolitan or suburban areas. As **FIGURE B**, also on page 27, shows, these new textures give the default Chicago scenery an appearance more closely resembling Microsoft's New York add-on scenery (but without the high-altitude photorealistic effects). The urban experience becomes even more realistic when you experience the expanded nighttime effects. The FS 5.1 designers have added lights to every city and town, which start illuminating as dusk falls.

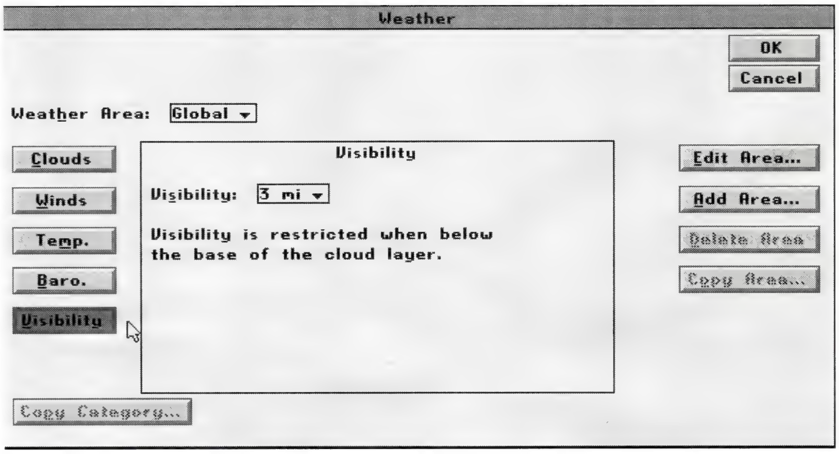
But you don't have to stick around the cities to enjoy the splendor of FS 5.1's new textures. For example, you could take a spring vacation to Munich and see the new, more detailed farmland that complements existing scenery such as that city's Olympic stadium, as shown in **FIGURE C** on page 27. Or you could visit the heartland of the United States—what could be better than taking in a Big Ten college football game on a fine Midwestern fall day? **FIGURE D**, also on page 27, shows our Cessna headed toward an overflight of the University of Illinois football stadium as we cruise over some stunningly realistic scenery.

The ground colors change automatically with the seasons, either taken from the computer's system clock or specified by the user. Best of all, the display performance of FS 5.1 is smoother and faster despite its more complex scenery elements.

And there's more for the intrepid computer pilot to discover—from the mountains to the prairies to the deserts white with sand, the new Flight Simulator 5.1 scenery textures help provide a greater-than-ever illusion of actual flight.

better weather

A much more detailed weather generator contributes greatly to the realism of FS 5.1. For the first time, FS5 provides three-dimensional clouds to



Weather Area: Global

Visibility

Visibility: 3 mi

Visibility is restricted when below the base of the cloud layer.

FIGURE G
By altering FS 5.1's visibility levels, computer pilots can practice under realistic instrument conditions.

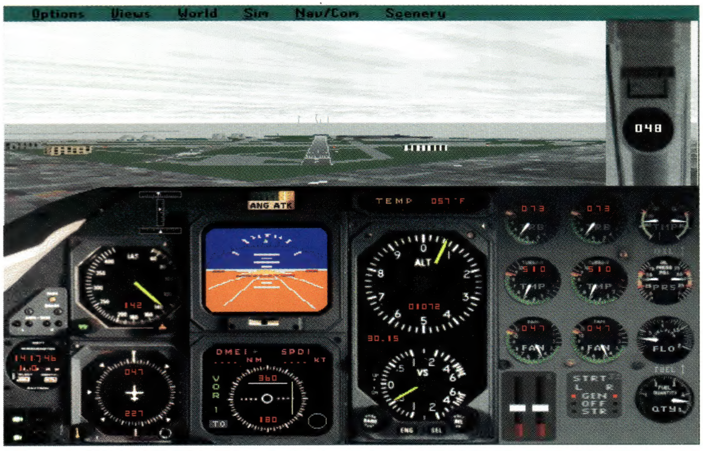


FIGURE H
You can see Midway Field emerge from the overcast in this Learjet pilot's perspective.

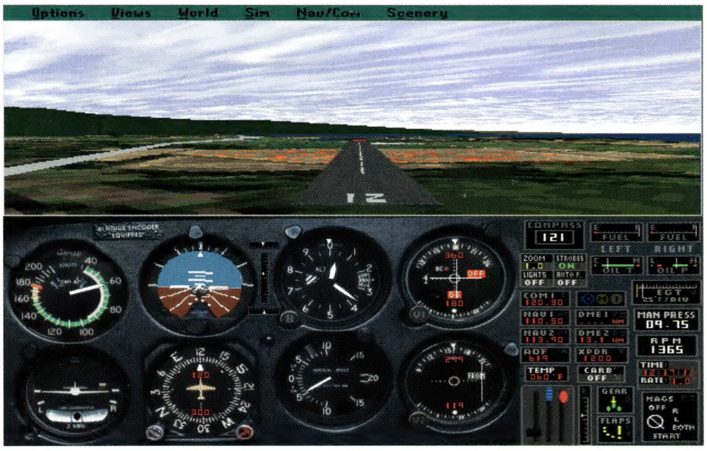


FIGURE I
Half Moon Bay's "disappearing" runway is one of the bugs fixed in the new version.

challenge computer pilots who aren't instrument rated. **FIGURE E** shows our Learjet skimming the top of a large cloud formation over Los Angeles; note the 3-D appearance of the clouds nearest our plane.

In fact, Flight Simulator 5.1 provides a number of new ways to deal with clouds. Those who make frequent use of the current system of defining one or more layers will find a couple of more options. For example, as you can see in **FIGURE F**, you can select one or more real-world cloud formations. When you do, FS 5.1 provides a description of that kind of cloud and will automatically specify the proper altitude, density, turbulence and icing properties.

Did we say icing? Yes—FS 5.1 also simulates wing icing, which can cause serious trouble for beginning and veteran pilots alike. And FS 5.1's handling of thunderstorms has been updated and is now much more realistic—computer pilots would be well advised to steer clear of the familiar black anvil-shaped monstrosities.

Besides providing new ways to create cloud layers, FS 5.1 lets you specify visibility levels, as you can see in **FIGURE G**. You can designate anything from crystal-clear unlimited visibility to a pea-soup fog that lets you see only 330 feet in front of your plane's nose. **FIGURE H** shows a Learjet landing at Chicago's Midway Airport during a thunderstorm under three-mile visibility conditions. At least the FS 5.1 scenery doesn't provide the many surrounding buildings that make approaches to the real-world Midway Field such an adventure.

One distinct benefit of the realistic cloud system and variable visibility settings is that they enable pilots to practice instrument approaches under much more realistic conditions. With just a few clicks of the mouse, a pilot can duplicate the prevailing weather conditions as gathered from a newspaper or television report, practice guiding a 15,000-pound Learjet down to the decision height (the altitude at which the pilot commits to the landing or goes around) and then sigh in relief as the runway emerges into visibility from out of the fog.

With all these new weather features, it might be easy to overlook the number of improvements made to FS 5.0's existing weather capabilities. For example, the temperature reading is now more accurate for the season, whether drawn from your computer's system clock or specified by the computer pilot. No longer does the outside temperature register at a scorching 104 degrees in the middle of January.

more improvements

FS 5.1 contains a number of additional improvements over the previous version that combine to make the program easier to use and understand. For example, when you're browsing through FS 5.1's menu structure, red dialog boxes sometimes pop up to inform you of an effect or requirement.

FS 5.1 also sports an improved flight model; the Cessna and Learjet perform much more smoothly under the new version. This improved performance becomes obvious on your first Cessna takeoff roll, because the plane rotates smoothly at 50 knots (the actual speed at which a real-world pilot would lift the plane's nose wheel off the runway). Other noticeable effects of the improved flight model are more realistic stall and spin performances. But despite the many enhancements to FS 5.1, the program runs better than before on low-end machines—rather than worse, as you might expect a more complex program to do.

Flight Simulator 5.1 also contains fixes to a number of bugs found in the previous version. For example, a defect in the runway at Half Moon Bay airport in the San Francisco scenery area (described in the article "Half Moon Bay Has Only Half a Runway," in the October/November 1994 issue of *Full Throttle*), shown in **FIGURE I**, has been repaired; the runway is now completely solid.

And the improvements don't stop there. For example, when you activate

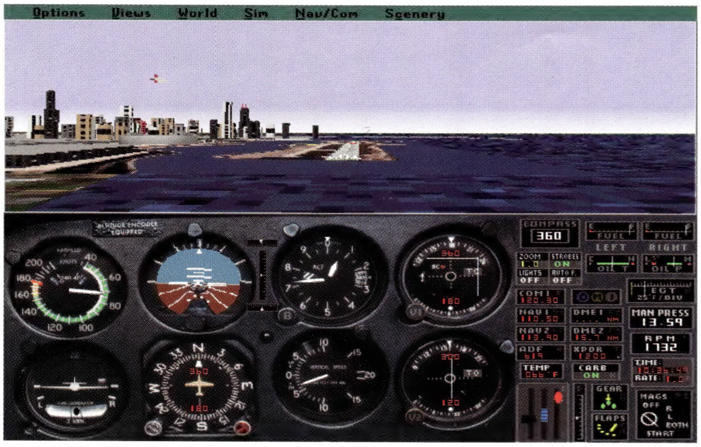


FIGURE J

Colored status lights make it easier to see which of your aircraft systems are active.

the strobes, carb heat or other setting that has a display on the instrument panel, FS5 not only changes the display text from OFF to ON, but it also displays the ON in bright green letters, as you can see in **FIGURE J**. This bright color makes it easier to determine at a glance which systems you have activated.

more fun

By themselves, version 5.1's improvements to Flight Simulator's graphics and flight model would make the program much more enjoyable to computer pilots. But the designers have also added a number of new flight challenges that present a way for FS5 pilots of every experience level to challenge their abilities. By choosing the new Options menu command Flight Challenges..., computer pilots unlock the door to a harrowing series of flight tasks.

The challenges take the form of everything from stunt flying to emergency drills. A pilot might choose to fly under the Golden Gate Bridge in a Learjet (or even fly a loop around it), undertake an instrument flight plan in bad weather, recover from a spin or land in the mountains with a failed engine.

FS 5.1's flight challenges are divided into basic and advanced categories; each challenge is further subdivided into four different skill levels. As pilots master a given level of challenge, they can advance to the higher difficulty settings. A complete description of the task at hand accompanies each challenge. **FIGURE K** shows an example.

The challenges not only allow the computer pilot to hone his or her real-world flight skills, but they also help beginning pilots understand complex flight maneuvers. The spin recovery flight challenges also provide the opportunity for pilots who don't have rudder pedals (and thus leave the Auto Coordination setting active) to practice this important emergency skill. Since a spin results from rudder deflection during a stall, it's impossible to put an FS5 plane into a spin if Auto Coordination is active.

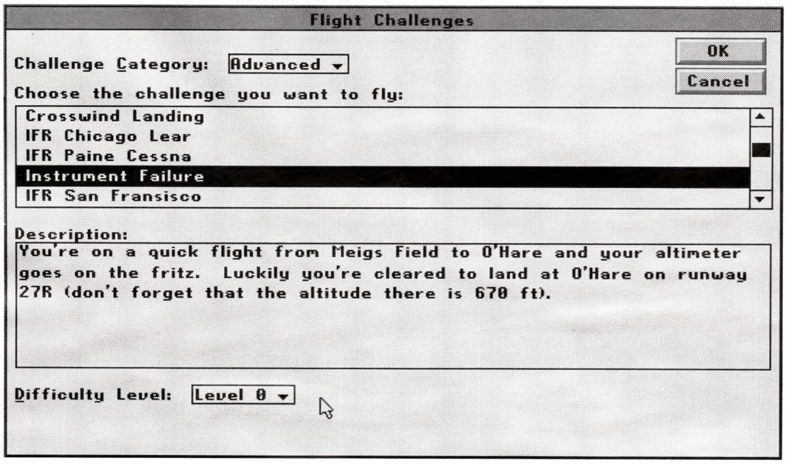
more airports

The CD-ROM version of FS 5.1 contains all the improvements we've mentioned in this article, but it goes further by taking advantage of the tremendous data storage capability of CD-ROM disks. FS 5.1 on CD-ROM sports a vastly greater amount of detail than the floppy disk version, in addition to eliminating the need to switch FS 5.1's three floppy disks during the installation process.

The CD-ROM features more than 100 extra airports, plus major roads, rivers, mountains and other prominent scenery objects from all over the world. It enables truly global flight through the default scenery for the first time in the history of Flight Simulator.

buying FS 5.1

Unlike the 5.0a patch for FS5, the new version of Flight Simulator isn't available as a free upgrade. However, currently registered users of FS5 are eligible for a $10 rebate from Microsoft when they buy the floppy disk version of FS 5.1. However, Flight Simulator enthusiasts would be tempted to buy the CD-ROM for the additional scenery alone, even if it didn't also sport FS 5.1's other substantial improvements to their current software. When you consider the vast number of additions made to this new version, FS 5.1 is clearly one of the best bargains available for devotees of realistic PC flight simulation.



Challenge Category: Advanced

Choose the challenge you want to fly:

Crosswind Landing
IFR Chicago Lear
IFR Paine Cessna
Instrument Failure
IFR San Fransisco

Description:

You're on a quick flight from Meigs Field to O'Hare and your altimeter goes on the fritz. Luckily you're cleared to land at O'Hare on runway 27R (don't forget that the altitude there is 670 ft).

Difficulty Level: Level 0

FIGURE K

You can select from a long list of entertaining flight challenges.

Microsoft Flight Simulator 5.1

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($10 rebate available for FS 5.0 registered users)
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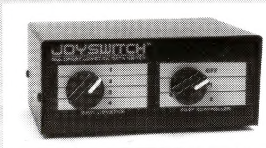

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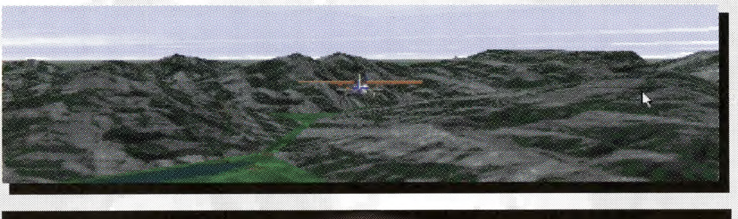

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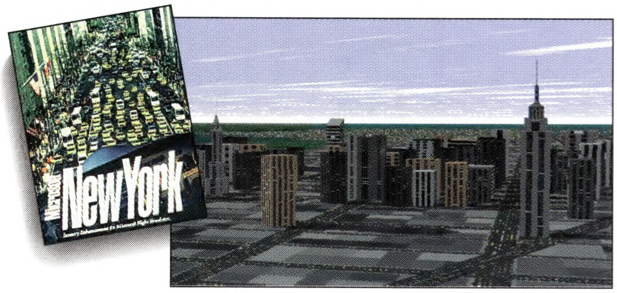

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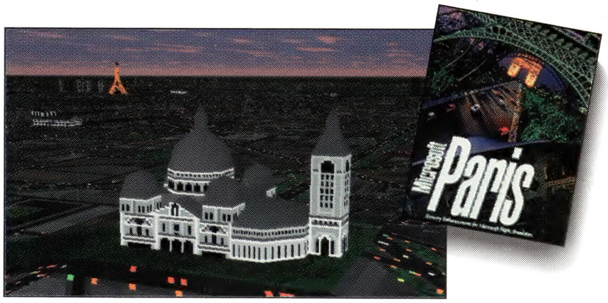

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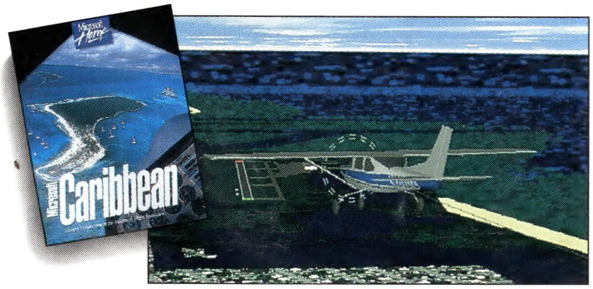

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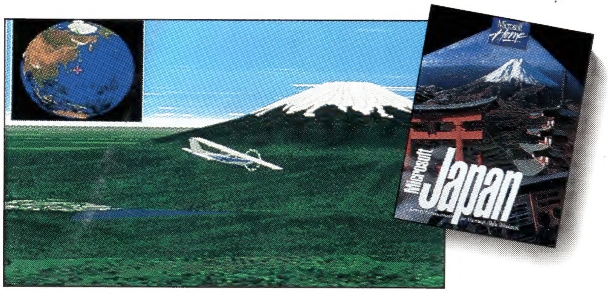

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